THE NEWSPAPER OF INFORMATION SYSTEMS MANAGEMENT
February 10, 1992 · Vol. XXVI · No. 6 · 124 Pages · $2/Copy · $48/Year

COMPUTERWORLD

DEC reorganization paves way for Alpha

R&D cuts expected as company narrows its focus

BY SALLY CUSACK
CW STAFF

MAYNARD, Mass. — While lifting the veil from its next-generation Alpha reduced instruction set computing processor last week, Digital Equipment Corp. was busy plotting a major restructuring that could tighten the company's focus on key markets and technologies. It could also leave DEC's employment ranks some 10,000 people lighter by year's end.

DEC plans to reorganize its management, reduce research and development spending and dramatically cut overhead costs to help the company become more cost-competitive in hardware and chip manufacturing, sources close to the company said.

The moves follow DEC's loss of $138.3 million for the second quarter ended Dec. 31, 1991, compared with a profit of $111.1 million in the corresponding period a year earlier.

DEC's new structure began taking form last week. Three key executives — William Demmer, vice president of VAX/VMS systems; F. Grant Saviers, vice president of personal computer systems and peripherals; and Dominic J. Lacava, vice president of Unix-based software and systems — will now report to William D. Strecker, vice president of engineering, a DEC spokeswoman confirmed.



Strecker *will now supervise three key DEC execs*

All three executives will retain their responsibilities and functions as heads of individual

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Revlon makes over IS unit

BY NELL MARGOLIS
CW STAFF

NEW YORK — Revlon, Inc. and Andersen Consulting are poised to announce a two-year, $10 million deal that puts the consultancy in charge of the cosmetic giant's IBM mainframe-centered information systems operation.

Concurrently, Revlon's in-house IS group will migrate the firm to a Hewlett-Packard Co.-based client/server architecture.

Executives at the $2.4 billion cosmetics firm confirmed a relationship with Andersen but otherwise declined comment prior to the formal announcement, expected early this week.

Moving right in

The agreement provides that Andersen will take over all application maintenance, network management and data processing activities of the IBM 3090/400 shop, according to several Andersen partners. The Andersen-run operation will be moved from Revlon's New York facilities to Andersen's Dallas data center. Fifteen of Revlon's approximately 100 IS employees have already become full-time Andersen employees and will help run the data center.

No cosmetic change

Revlon has hired Andersen to do the following:

- **Migrate IBM 3090 host processing to distributed client/server architecture around HP minicomputers.**
- **Assume all application maintenance, network management and systems management functions.**
- **Shift data center from Revlon's New York facility to Dallas.**

CW Chart: Marie Haines

An additional contingent of Revlon IS staff members will stay aboard to aid in the transition but will eventually be phased out in a staggered layoff. Some 20 IS staff members will remain at Revlon. An estimated 20 computer-room jobs will be eliminated and those who fill them laid off, one source said. Eight or nine more, he added, have already departed.

Andersen's network management mandate, a partner said, includes linking Revlon's manufacturing operations in Oxford, N.C., Phoenix and Edison, N.J. "We'll also provide local circuits to warehouses and satellite locations — for instance, corporate headquarters in Manhattan,"

Continued on page 24

Challenge, notoriety cited as impetus for virus developers

BY MICHAEL ALEXANDER
CW STAFF

What motivates a programmer to write a virus? The thrill, declared Hell Raiser, a self-styled virus author and a member of Phalcon/Skism, a group of about a dozen computer hackers scattered across North America.

In an unusual telephone conference call to *Computerworld* last week, 10 callers who said they were members of Phalcon/Skism claimed to be responsible for writing several of the viruses now on the loose.

To protect their identities, the callers used such handles as Garbage Heap, Nightcrawler, Demogorgon, Dark Angel and Time Lord. They said their ages range from 15 to 23 years old, although *Computerworld* could not independently verify their identities.

Getting attention

The virus authors, as they often referred to themselves, said they arranged the teleconference to air their side of the story and to talk about their unorthodox and contradictory brand of computer ethics. "For the most part, virus authors are seen as a lot more malicious than we actually are," Garbage Heap said.

His compatriots said they write viruses mainly for the thrill but also for the challenge and the status it brings within the computer underground. The group said it is not interested in causing harm and seldom creates viruses that are deliberately designed to cause damage. "It's sort of like graffiti — getting our name across — and damage hap-

Continued on page 8

Notebooks gain key desktop features

BY MICHAEL FITZGERALD
CW STAFF

A slew of notebooks is looming over the horizon, offering features that could finally give users justification to employ them as desktop replacements if they are willing to pay a premium for that privilege.

AT&T's NCR Division's next-generation Safari notebook computer, expected out March 11, best exemplifies the new breed of system, analysts said. A follow-on to its original Safari notebook introduced last year, the new computer will be smaller, weigh less and offer networking and display capabilities similar to full desktop systems, observers who have been briefed on the system said.

And by Comdex/Spring '92, battery-powered notebooks with color screens will be touted by more than a handful of vendors.

Joining Epson America, Inc., Sharp Electronics Corp., Dell Computer Corp. and AST Research, Inc. will likely be Toshiba America Information Systems, Inc., which is expected to introduce a notebook with an active-matrix color screen, and Zenith Data Systems, which may unveil a passive-matrix color product.

The screens used in these systems will be more readable than those in the previous generation of notebooks — another in-

Continued on page 16

Jungle excursion

AT&T's Safari NSL/25 notebook is indicative of the new breed of portable systems

Processor Intel 25-MHz 80386 SL

Memory 2M bytes, expandable to 20M bytes.

Mass storage Choice of 80M-byte or 120M-byte hard drive; PCMCIA drive standard; optional 3½-in. floppy drive.

Communications Optional v.32 modem, 9.6K bit/sec. fax/modem or cellular modem and cable to connect to a cellular phone.

Dimensions 11 by 8.1 by 1.8 in.

Weight 4.9 pounds.

Battery Supports two nickel cadmium batteries with life of up to eight hours.

List price Between $5,000 and $6,000.

CW Chart: Michael Siggins

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Remaining incognito, most computer hackers say it takes one to catch one. Page 8.



Microsoft creates tripartite president's office. Page 4.

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6 Variety is the bane of life for an insurance company trying to tie E-mail users together.

7 Commodities exchanges in Chicago will soon be using pen-based portable terminals to record trades ASAP.

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Quotable

"I would like to see products come out that are the brainchild of engineering departments rather than marketing departments, and this smells like marketing has had too heavy a hand."

WAYNE MUNN

On Intel's upcoming P24 chip. See story page 20.

DESKTOP COMPUTING

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36 Technology Analysis: The 25-MHz **AST Premium Exec 386SX** and the **Acer Anywhere 1120NX** are solid machines, reviewers say. The Acer features an ergonomic design, while the AST is 20% faster than 20-MHz models.

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COMPUTERWORLD **NEW for '92**

With this issue, *Computerworld* launches the first in a series of changes that will dramatically revamp and improve the look and feel of the newspaper during 1992. This week we introduce four new technical sections: Desktop Computing, Workgroup Computing, Enterprise Networking and Large Systems. A subsection on Application Development has also been added in the Large Systems section.

In addition, the pages containing the latest news of the week have been moved up closer to the front of the paper.

This section revamp, our first in three years, is being made in recognition of the dramatic industry shift toward more functional use of computers. Previously, our technical sections centered on hardware and software platforms. The new sections recognize that buying decisions are now based much more on how systems will be used than on the machine.

Readers interested in single-user PCs, workstations and software can turn to Desktop Computing. Coverage of LANs, servers, small multiuser systems and group applications can be found in Workgroup Computing. The Enterprise Networking section will focus on connecting desktops and workgroups across the organization.

Large Systems continues *Computerworld*'s comprehensive coverage of data center hardware and software. Emerging software technologies such as CASE, object-oriented development and programming productivity software are in Application Development.

EXECUTIVE BRIEFING

■ **DEC is planning yet another reorganization** to sharpen the company's focus on key markets. The plan could reduce R&D spending by nearly 25% and could cut the work force by another 10,000 by year's end. The streamlining, which appeared to begin last week with the reassignment of some hardware executives, comes as DEC is preparing to release its Alpha RISC-based processor. **Page 1.**

■ **At last count, there were 5 million people using LAN-based E-mail,** and that number may exceed 50 million in 1995. But host-based and public E-mail services will not go the way of the dodo. They are being interconnected with LAN-based systems to perform functions such as message switching, wide-area connectivity, directory integration and sophisticated administrative services. **Page 83.**

■ **Revlon and Andersen Consulting are set to reveal** a $10 million outsourcing deal. The cosmetics giant is moving from host-based to distributed client/server computing. **Page 1.**

■ **Hackers say they just want to have fun.** But in an interview with *Computerworld*, they admitted that their antics can have damaging side effects. **Page 1.**

■ **Two large commodity exchanges prepare to go portable,** with handheld computers replacing paper in the trading pits. Developers hope the systems will protect against fraud. **Page 7.** Meanwhile, several firms are preparing to release notebook-size portables at Comdex/Spring '92. **Page 1.**

■ **An outgoing, IS-savvy executive departs in Microsoft reshuffling,** but users aren't likely to see any other significant changes. **Page 4.**

■ **The concept of integrated CASE** is taking body blows. Managers at user sites say they are much more interested in modular CASE techniques aimed at phases of the application development process. **Page 73.**

■ **IBM reiterated its goal of having OS/2 2.0 ready for shipment by the end of March,** stating that it is 'roaring through' the current phase of beta testing with internal users. **Page 35.**

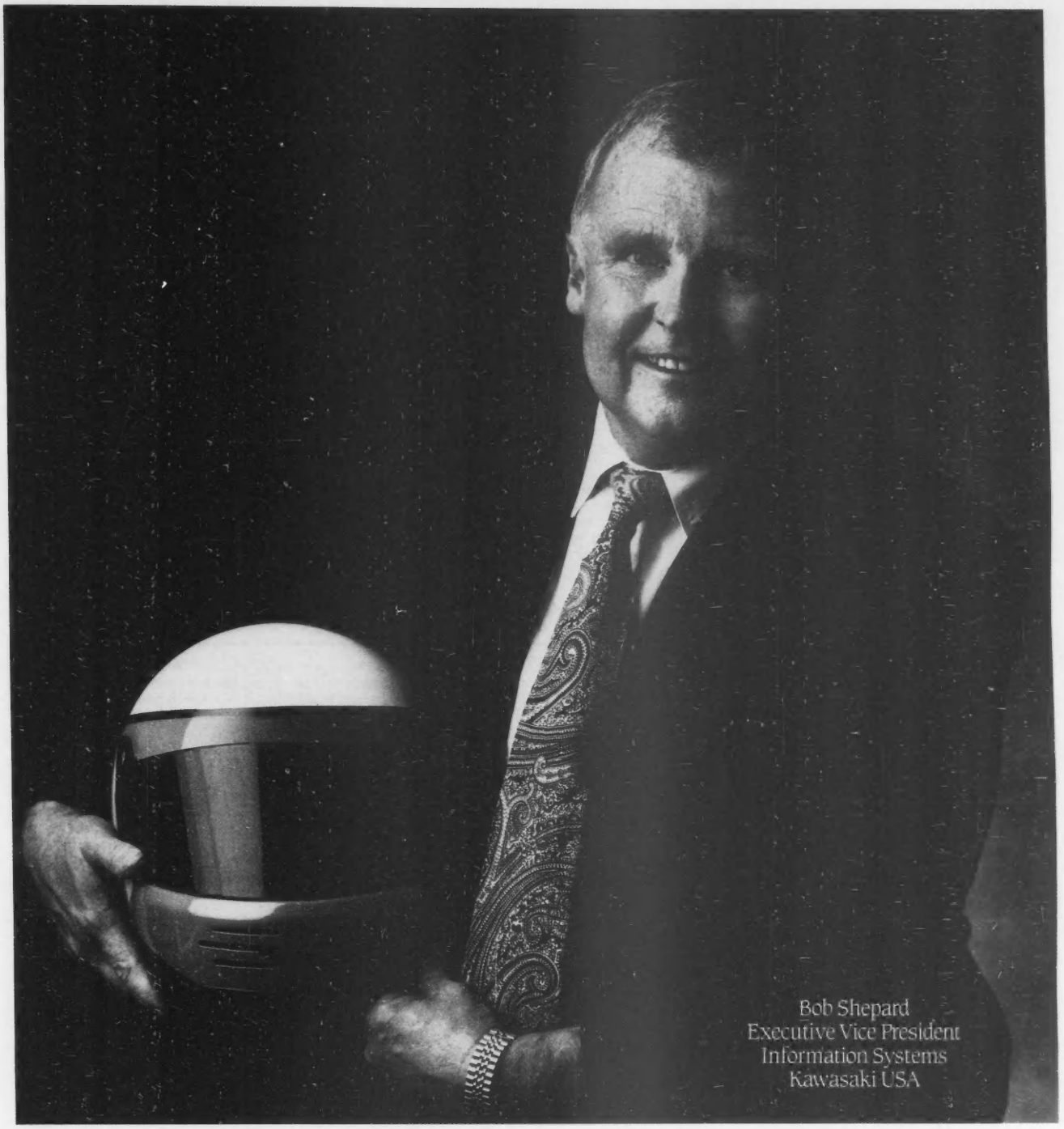
■ **Reader's Digest hopes to clean up the junk mail** and better target its marketing efforts by enhancing the database behind its direct-mail system. **Page 97.**

■ **'If you've got frame relay ready, we're interested,'** seems to be the word from network managers. At the recent Frame Relay Users Roundtable, potential frame-relay customers said they want to know more about the fast-packet technology. **Page 55.**

■ **The IS staff for the government of Israel took a cue from the manufacturing world** when it began planning systems based on a bill of material approach. This IS document is the staff's 'bible,' answering such questions as what a system should do and how much it should cost. **Page 93.**

■ **The future role of IBM's 3745 communications processor is taking shape.** But while IBM says the system will be part of its peer-to-peer SNA for years to come, outsiders question whether the front-end machine can handle the bandwidth demands of even the near future. **Page 55.**

■ **On site this week:** NBC is moving ahead with plans for a Macintosh-heavy installation at its Chicago affiliate, hoping to boost the sales staff's productivity with the Apple systems. **Page 35.** A maze of environmental regulations created by many government agencies throughout the world persuaded Mobil Oil to develop its Earthlaw system, which was designed to keep the oil company up to date with the changes in laws and concerns worldwide. **Page 78.**



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User impact unlikely in Microsoft revamp

BY JAMES DALY
CW STAFF

REDMOND, Wash. — The sudden dismissal last week of Microsoft Corp. President Michael R. Hallman and the subsequent executive suite reorganization is expected to cause few if any changes for users.

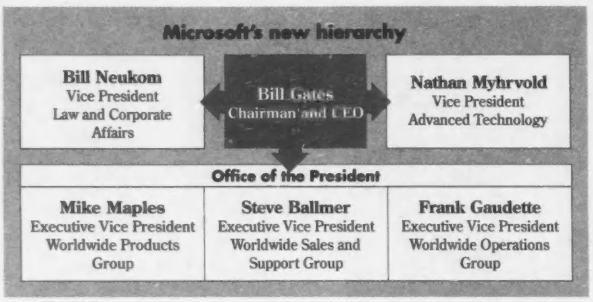
"If [Microsoft Chairman Bill] Gates had left, I'd be worrying about what was coming next, but I don't think these moves are going to affect questions like 'Does their code work' and 'Do the applications do what they are supposed to?'" said Lance Rigdon, a senior systems analyst at Equitable Real Estate, Inc., an Atlanta-based commercial real estate manager.

Users and analysts viewed the reorganization as a positive and necessary move to bring a more diversified Microsoft forward. However, some company insiders suggested the changes resulted from friction between the conservative Hallman and intense Gates. Without Hallman, Microsoft will now be run by Gates and an office of the president, which will include three executive vice presidents who are longtime Gates compatriots.

Each executive will oversee a newly outlined area of "strategic focus." Steven Ballmer will head up worldwide sales and support while Mike Maples handles the worldwide products group. Frank Gaudette will be responsible for worldwide operations.

"I don't think it's a reflection on [Hallman's] ability but on the need to manage the company differently," said J. Paul Grayson, chairman and chief executive officer of Micrografx, Inc. "Differently in the sense that Bill is a very strong leader and personally involved in each of those areas. It removes a layer of management between the top execs and himself."

"Hallman wasn't a failure, but there was not a total success either," said Michael Maples, an ex-IBMer who has headed Microsoft's applications software business since 1988. "There was never a clear definition of Mike and Bill's roles and who was responsible for what."



Source: Microsoft Corp.

In a teleconference, Gates said Microsoft's rapid growth necessitated the need for the new structure, noting that "no one person" could fulfill the demands of the position. "It made more sense to split the job up," he said.

Microsoft has grown at an incredible rate over the past two years. It now has more than 10,000 employees as well as 100 million DOS and 9 million Windows customers.

Hallman's original edict included strengthening Microsoft's business with large corporate customers, and he developed a reputation as one who was readily accessible. "Mike went out of his way to get to know you and your needs," said James Wensley, chief information officer at Hughes Corp. in Culver City, Calif., who met with Hallman several times to discuss products.

However, Hallman, a former executive at The Boeing Co. and IBM, never fit into Microsoft's hyperkinetic corporate culture, and his efforts to force his style onto the aggressive Microsoft simply would not take root.

Gates said he had been considering the changes for several weeks but that the decision to ask for Hallman's resignation came at a Saturday meeting of Microsoft's board.

Hallman's status has been questioned since October 1991, when he unloaded a whopping 93% of his stock in Microsoft, according to reports filed with the Securities and Exchange Commission.

Microsoft officials also said the company will restructure its development organizations into five product divisions: systems; desktop applications; database and development tools; consumer; and workgroup.

Languages Division general manager departs

It appears that little at Microsoft will go unaffected as a result of the recent reorganization, and that applies to the Languages Division as well.

Fred Gray, general manager at the Languages business unit, will no longer hold that position, although he will remain with Microsoft in an as-yet-undisclosed capacity, according to the company.

The move comes at a key time in the unit's life. Not only is it preparing for the introduction of its first object-oriented C product, but it has also been losing market share.

For example, Shearson Lehman Brothers, Inc. reports that Borland International, Inc.'s languages group has been experiencing revenue gains averaging more than 50% during its past two quarters, while Microsoft's group has faced decreases of 15% and 36%, respectively, during the same period.

Stewart Chapin, group product manager for languages and development tools at Microsoft, said that Gray's departure from the position was driven by Executive Vice President Steve Ballmer's desire to exercise more control over the unit as it faces the release of the company's object-oriented C development language, sometimes called C 7.0.

Microsoft will reportedly be demonstrating some technology from the language, which recently went into beta testing, at the C++ Across America seminars being held in several U.S. cities from Feb. 11-21.

The language will compete directly with Borland's Borland C++, which has been gaining market share in the C languages arena, according to analysts.

However, a strong showing by Microsoft with C 7.0 could stem some of the flow to Borland, according to observers. "At a minimum, it would stop the gains of Borland," predicted Christopher Mortenson, an analyst at Alex. Brown & Sons, Inc.

CHRISTOPHER LINDQUIST

Wall Street looks favorably on Lotus tech strategy

BY ROSEMARY HAMILTON
CW STAFF

NEW YORK — Lotus Development Corp. recently scored some points with Wall Street analysts by more clearly mapping out plans to spruce up its spreadsheet line and to provide consistent technologies across its application suite.

The catch now is to deliver on all these promises to users, some observers said. "Their functionality isn't up to the functionality being demonstrated by their competitors," said Sheldon Laube, national director of information technology at Price Waterhouse. "Once again, I fear they might be late. When it's available, I'll take a look."

However, several Wall Street analysts contacted last week said John Landry, Lotus' chief technology officer, explained a clearer strategy at a meeting late last month than they had previously heard from the company. Some said they now felt more comfortable with Lotus' ability to ship its new technologies in the time frame it had committed to.

"The theme isn't really new; I just think it's being articulated in a far more powerful way, so it sounds more credible," said Mary McCaffrey, a vice president at C. J. Lawrence, Morgan Grenfell, Inc. in New York. "He was very clear that this technology would start shipping in the next 12 to 15 months, and I'm sure he's gotten the message that you can't say that unless you feel very comfortable about it."

In his presentation, Landry said the company is currently working on a number of new technology efforts, spanning improved user interfaces to object-oriented programming. He made the following commitments:


Lotus' Landry *clarified the firm's technology strategy*

- Three releases of the 1-2-3 for Windows product by mid-1993. The third release will be "a rewrite of the code base to fully object-oriented programming styles, using C++."
- A major release of 1-2-3 for DOS, code-named Predator, "that will be a full graphical user interface system built in the constraints that exist in the DOS 640K space."
- Plans for innovative user interfaces under a program called Working Alike. The goal is to provide common user interfaces for Lotus applications.

Analysts said that while Lotus is still perceived as being behind its competitors in getting new technologies to market, Landry may be able to turn that around.

"It's clear that they've identified some very important technologies and with Landry they plan to make good on those commitments," said Paul Johnson, a vice president at First Boston Corp. in New York.

At least one user said Lotus' plan to deliver new technologies over the next 15 months fits his implementation schedule.

Second-class postage paid at Framingham, Mass., and additional mailing offices. *Computerworld* (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Copyright 1992 by CW Publishing/Inc. All rights reserved. *Computerworld* can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed. Back issues, if available, may be purchased through Margaret McIndoe. Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970, 508-744-3350. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $2.00 a copy: U.S. — $48 a year; Canada — $110 a year; Central & So. America — $130 (surface), $250.00 (airmail) a year; Europe — $195 a year; all other countries — $295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Subscriptions call toll free (800) 669-1002.
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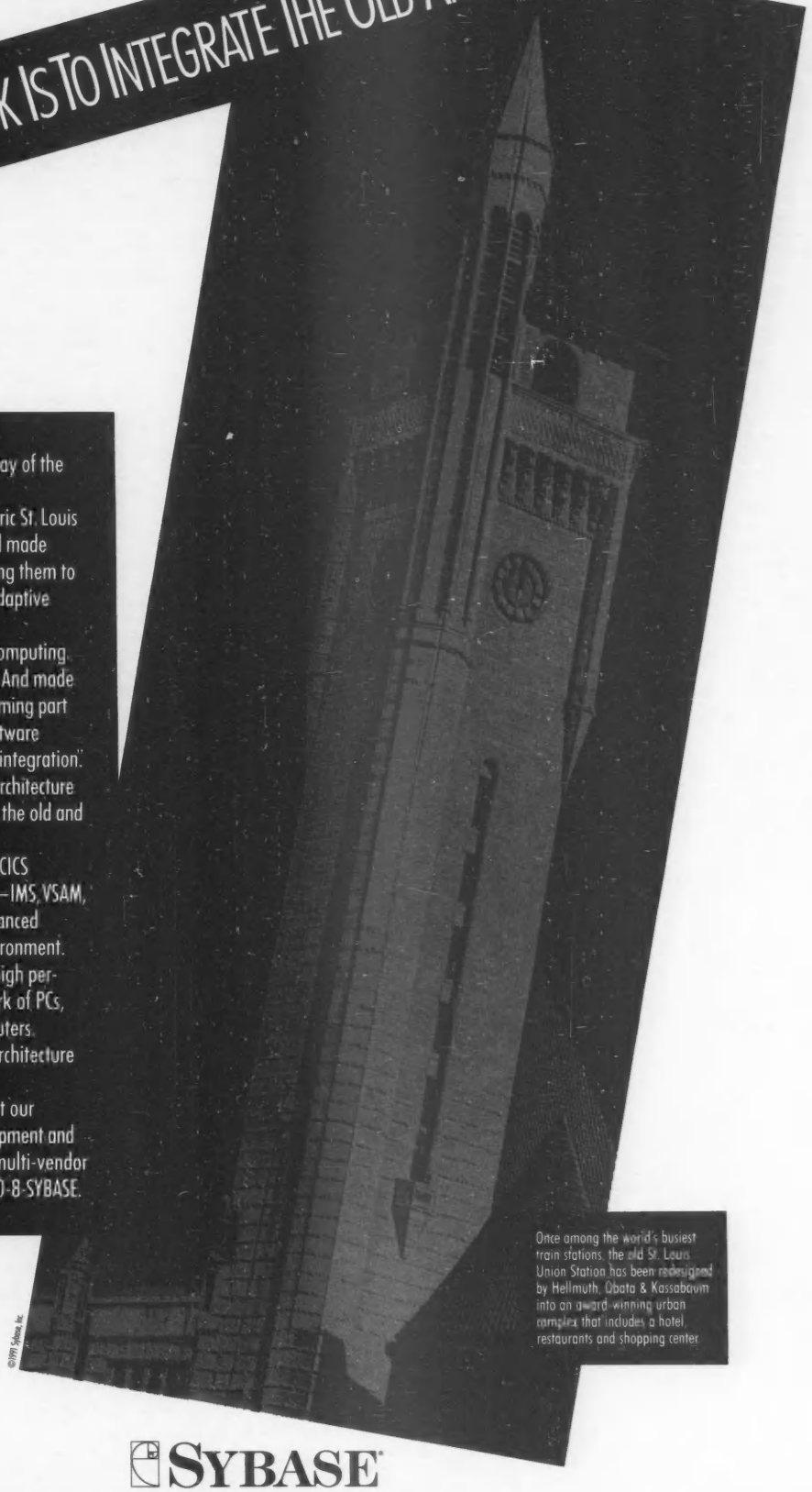
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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Industry giants agree on E-mail interface

BY JIM NASH
CW STAFF

A quartet of desktop heavyweights last week announced plans to publish an open software specification for electronic mail that they say will speed the development of message-enabled applications. Industry observers immediately positioned the plan as a slap at a competing specification sponsored by Microsoft Corp., while information systems managers appeared unsure of the proposal's impact.

Lotus Development Corp., Novell, Inc., Apple Computer, Inc. and Borland International, Inc. said they will deliver the Vendor-Independent Messaging (VIM) interface next month to third-party software vendors. Microsoft, meanwhile, has delivered a competing interface called Messaging Application Program Interface (MAPI)

IBM said it will support VIM.

VIM will tell applications how to access mail directories, send messages and store mail. It will reportedly allow software vendors to write a single piece of code to link their applications to any VIM-compliant mail system.

VIM is being positioned as a successor to Lotus' Open Messaging Interface (OMI), yet none of VIM's founders could illustrate the difference between the two. OMI, which was first announced in September by Lotus, Apple and IBM, is not available.

A Lotus spokesman in Cambridge, Mass., said comparisons between the two would come when the new specifications are finished. VIM has been described only in broad terms, and some consider it to be little more than a revamped OMI.



Apple's Heinen *says VIM will save time and money*

Like OMI, the new specification is expected to have trickle-down benefits for end users. The royalty-free VIM would give corporate and third-party developers of applications such as spreadsheets a common model for building code that links their products to any VIM-compliant E-mail system.

This would reduce the cost and creation time of software that incorporates existing messaging systems, according to Roger Heinen, vice president and general manager of Apple's Macintosh Software Architecture Division. Such software can use underlying mail programs without end users having to exit and call up their E-mail systems.

"E-mail's been growing much more slowly than many people had thought," said John Girton, an analyst at Van Kasper & Co. in San Francisco. "This team should give third-party and corporate developers confidence enough to link their applications to E-mail systems without worrying about which system is the most strategic."

VIM addresses key groupware needs such as the automated capability to share files, parts of files and whole applications among end users.

Indignant howls from Microsoft, the world's largest software developer, accompanied news of the revamped interface specification. Although the Redmond, Wash.-based company was publicly invited to join in on future interface work by the four, it was not asked to participate in the formation of VIM, said Cameron Myhrvold, Microsoft's director of developer relations.

"They say this is open? VIM stands for Vendors Ignoring Microsoft," Myhrvold said. This "political affair," as Myhrvold calls it, could damage the interface's long-term success, said Chuck Digate, president of Beyond, Inc., an E-mail developer in Cambridge. Other critical software players need to join, Digate said, are Banyan Systems, Inc., Soft-Switch, Inc. and Digital Equipment Corp.

Microsoft's interface, besides being a Windows-only set of code, is an upper-level interface, said Mike Zisman, president of Soft-Switch. It concentrates more on its applications.

Novell has an interface specification known as Standard Message Format, which links E-mail systems to the Provo, Utah-based company's Message Handling System mail engine. Novell's specification is a file-format interface, while VIM will be a procedural programming interface. Novell expects no repercussions for its interface based on VIM work, a company spokesman said.

Neither Apple nor Borland have a messaging interface.

Wordperfect Corp. has been involved in Microsoft's interface work and was one of the companies offering input on OMI. Dave Clare, director of development for the Orem, Utah-based developer, said he is encouraged by news of VIM and its founders.

"I expect that our applications will become VIM-compliant when the specification becomes more solid and well-accepted," Clare said. While he sees the value in Microsoft's interface, he noted that it remains Windows-based, and VIM appears to be more generic.

One source close to the four VIM sponsors who requested anonymity said the differences between OMI and VIM are likely to be small.

Flood of X.400 E-mail flavors confounds user

BY JOANIE M. WEXLER
CW STAFF

PHILADELPHIA — Too much diversity in X.400-compliant addressing schemes remains the biggest electronic mail glitch for an insurer that is trying to bring nearly 250 brokers into its E-mail fold.

To its dismay, PMA Reinsurance Corp. (PMARC), which insures primary insurance carriers, has discovered that X.400 E-mail "standards" come in many implementation flavors. As a precursor for future connections, the company is testing X.400 communications with the dozen brokers with whom it most frequently exchanges messages and documents.

The brokers use a variety of proprietary local E-mail systems and X.400-based carrier services. "The hardest part is just trying to unravel the different carriers' incompatibilities," said John M. Cunningham, PMARC's director of MIS.

Cunningham explained that the various public E-mail services could be based on either the 1984 or 1988 Open Systems Interconnect (OSI) X.400 standards. Even systems conforming to the same version contain implementation inconsistencies, though the 1984 version in particular leaves much open to interpretation, especially in naming conventions.

For example, "It took us a while to communicate with one broker because their carrier service — which followed the '84 standard — interpreted our name differently. We all had to work with both carriers to figure out how to do the addressing," Cunningham explained.

In general, "X.400 is experiencing growing pains," said Mark Gleason, a senior network analyst at PMARC. "If your system supports certain functions and the receiving system does not, you get back a 'nondeliverable' message." This can happen, he said, if routing and attributes information accompanying a message is meaningful to one X.400 implementation but not to another.

PMARC is also trying to accommodate underwriters and claims personnel doing audits on the road who need to communicate directly with brokers. Similarly, the firm would like telecommuters to be able to use their native E-mail systems.

Cutting costs

PMARC is hunting for X.400-compliant personal computer and laptop software that would eliminate costly gateways on site and multiple carrier service subscriptions for each remote user. Locally, PMARC now uses Da Vinci Systems Corp.'s Da Vinci Email, which is delivered via Novell, Inc.'s Message Handling Service transport service to a Retix X.400 gateway. The gateway translates the Da Vinci format into X.400.

"Native" X.400 software for the PC would eliminate the need for a gateway at each of PMARC's six sites. A gateway costs from $5,000 to $30,000, "plus a huge management overhead," said Nina Burns, a principal at Network Marketing Solutions, Inc. in Menlo Park, Calif.

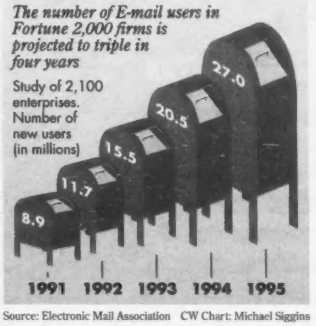
Many X.400 PC products require an expensive X.25 line. "That's way out of reach cost-wise; no MIS manager in his right mind would put [the necessary equipment] for X.25 at someone's house," Gleason said.

Currently, PMARC personnel on the road dial up their own desktop PC via Norton/Symantec Corp.'s PCAnywhere software. To reach a broker, they "mirror" their PC on the laptop and dial back out to business partners.

"So we've got this big phone bill sitting there," Cunningham said.

Take a letter

The number of E-mail users in Fortune 2,000 firms is projected to triple in four years



Source: Electronic Mail Association CW Chart: Michael Siggins

New phase for X.400

The X.400 Application Program Interface Association (APIA) is slated to use this week's Networld show in Boston to announce Phase 3 of its public-domain specification for linking applications to OSI X.400 E-mail engines.

Phase 3 will reportedly include interfaces to electronic data interchange (EDI) applications and to X.400 Message Store.

X.400 Message Store is the provision in the 1988 version of the X.400 standard for storing X.400 E-mail when a recipient is not on-line and for transferring the mail to another messaging transport agent.

Support for EDI — the electronic exchange of business documents — will allow a developer to write an EDI program that can link to an X.400 server for local- or wide-area communications, according to David Knight, an X.400 APIA member and former association chairman. This specification "is tailored to provide the extremely high reliability in data transfer that is required by an EDI application," he said.

Knight explained that EDI is becoming automated in that a database, spreadsheet or custom business application such as order processing can generate an EDI message.

With the association's API-to-X.400 Message Store, an application developer can use a C-level programmatic interface rather than having to produce the complex X.400 protocols directly from the application, Knight said. "This is a simpler interface for developers to write to rather than having to know all X.400 code and write to that," said Nina Burns, a principal at Menlo Park, Calif.-based consultancy Network Marketing Solutions.

Phase 1 of the APIA specification defined a gateway API that vendors have used to build links from proprietary mail systems to X.400 servers conforming to the 1984 X.400 standard. Phase 2 allowed client applications to link directly to an X.400 server.

JOANIE M. WEXLER

Chicago traders toss paper for portable, pen-based interfaces

Handheld systems would record transactions immediately

BY ELLIS BOOKER
CW STAFF

CHICAGO — After more than two years of preparation, the nation's largest commodity exchanges will commence testing portable order-entry terminals — including one with a totally pen-based interface — later this month.

The Chicago Board of Trade (CBOT) and the Chicago Mercantile Exchange (Merc) began exploring an "electronic trading card" following a 1989 Federal Bureau of Investigation undercover probe. The investigation caught some traders illegally making prearranged trades or delaying client trades in order to place their own orders amid the noise and bustle in the crowded trading pits.

> WHEN THE FUTURE system is in progress, trades will be able to record immediately.

The handheld systems will record and date-stamp trades as they happen, thwarting such illegal practices. But traders, too, will benefit, according to Bill Taylor, manager of technology planning at the Merc.

"Right now, clerks from [the traders'] clearing firm pick up the paper orders every half hour," Taylor said. These cards must then be keyed into each clearing firm's computer and then transmitted over a wide-area network to the computers of the two exchanges.

When the future system is in progress, trades will be able to record immediately — meaning traders on the floor can be advised quickly of mismatched or incomplete transactions, so-called "out trades."

"Today, our trades for one day are typically handled the next morning, sometimes when the market prices are very disadvantageous [to the traders]," Taylor explained.

The first live beta test, scheduled for later this month in the CBOT's wheat pit and the Merc's deutsche mark pit, will involve a prototype device from Spectrix, Inc. in Evanston, Ill. The Spectrix system uses the touch-screen Panasonic JT785 and key pad.

In addition to the Spectrix unit, systems from Synerdyne, Inc. in Santa Monica, Calif., and Texas Instruments, Inc. will be tested. The Synerdyne system is totally pen-based; the TI unit has both a pen and a key pad.



Details of the trading system have yet to be worked out, however. For instance, a decision on the communications medium used between portable systems and a base station on the exchange floor has yet to be decided. A full-featured end-user interface for the portable systems will also have to be developed.

A time frame for the electronic trading card award has not been set, but when it does come it will be sizable. As for the amount, the two exchanges have a combined membership of close to 7,000 brokers and traders, and ballpark prices for the order-entry units range from $2,000 to $5,000 apiece.

A spokeswoman for the CBOT said local traders — those who only trade for themselves — will likely be using an initial version of the electronic system later this year or by early 1993. Brokers representing clients are expected to follow a year later, she said.

CORRECTIONS

An article in the Jan. 20 issue on Intel Corp.'s coming P5 processor misstated the chip's life cycle. The chip will probably need three years to gain significant presence in the systems market.

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In the Jan. 27 issue, Computer Network Technology Corp. was mistakenly identified as Communications Network Technology Corp.

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An article in the Jan. 27 issue incorrectly cited the name of Alice Lusk, Electronic Data Systems Corp.'s Health and Benefits strategic business unit chief.

•••••••••••••

The phone number for Frye Computer Systems, Inc. was listed incorrectly in the Jan. 27 issue of Product Spotlight. The correct number is (617) 451-6364.

•••••••••••••

A new product announcement [CW, Feb. 3] gave incorrect pricing for Uni-Zip compression software from Precise Electronics in Brookline, Mass. Uni-Zip costs $149 per workstation.

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NEWS SHORTS

HP adds object-oriented tools

Hewlett-Packard Co. introduced a library of 150 object-oriented components for building the Open Software Foundation's (OSF) Motif graphical user interfaces. Based on C++, HP Interview Plus was designed to speed development of custom Motif interfaces over those built with OSF/Motif tool kits. The $4,950 product, which is scheduled to ship this summer, runs on HP Apollo 9000 Series 700 workstations and Sparcstations from Sun Microsystems, Inc.

Intellicorp finds new partner

Four months after calling off a planned merger with Knowledgeware, Inc., Intellicorp, Inc. has penned a joint development deal with James Martin & Co. The two computer-aided software engineering firms will build and sell enterprise modelling tools based on Prokappa, Intellicorp's object-oriented front-end development tool, and a new methodology from James Martin for analyzing business processes. Intellicorp also announced that James Martin has bought "in excess of 5%" of Intellicorp's stock.

Computer glitch hits tax filers

A computer glitch caused the Internal Revenue Service to mistakenly inform about 30,000 taxpayers who filed electronic returns that they were getting refunds, an IRS spokeswoman said. The problem is that many electronic filers got an immediate refund in the form of a loan from their tax preparers — a loan that will now have to be repaid, the spokeswoman said. The glitch affected returns filed electronically from Jan. 10-27.

Gillette to outsource network

The Gillette Co. is expected next week to announce a three-year contract under which it will move international sites to BT North America, Inc.'s Global Network Services because it no longer wants to be its own network vendor and because its present network, supplied by individual Postal Telephone and Telegraph Authorities, suffers throughput degradation.

Lotus wins, wins again

Good news came in twos last week for Lotus Development Corp. First came dismissal of a 3-year-old class action suit in which stockholders claimed Lotus misled them about delays on 1-2-3 Release 3.0. A federal judge in Boston ruled that plans for an earlier release are not necessarily false when the product comes out later than projected. Second, the company reported that its CC:Mail division had a record performance last year and now counts more than 1.5 million users. Recent additions include the U.S. Navy, which signed a contract for CC:Mail that could be worth up to $140 million.

Barron heads Xerox unit

Patricia C. Barron, vice president of MIS at Xerox Corp., was named president of a newly formed Xerox division that sells office document products. The appointment was part of a major restructuring of top management at corporate headquarters in Stamford, Conn. Xerox has not named a replacement for the information systems position. Barron had been IS chief since 1987 and worked in business positions at Xerox for nine years before that.

Short takes

Comdisco Disaster Recovery Services, Inc. in Rosemont, Ill., best known for its data center recovery services, last week announced its entry into the workstation and local-area network disaster protection business . . . IBM said it is looking at the possibility of turning over part of its electronic card manufacturing to Solectron Corp. in exchange for a minority shareholder status in Solectron . . . Central Point Software, Inc. has announced that Charles M. Boesenberg, formerly president of Mips Computer Systems, Inc., has been named president and chief operating officer.

More news shorts on page 14

Hacking the legal way

Breaking into computer systems takes on new role in security testing

BY MICHAEL ALEXANDER
CW STAFF

Peter Goldis, an independent consultant and IBM mainframe security expert based in Cambridge, Mass., earns his living by getting into places where he is not wanted.

Goldis is a penetration tester, one of a handful of full-time practitioners of the arcane art of legally breaking and entering computer systems.

Penetration testing — hiring outsiders to probe computer systems for security loopholes — is catching on in corporate America, according to practitioners and some buyers of penetration services.

Most often, testing is an inside job because current and former employees are assumed to be the primary security risk, Goldis said. "You start with whatever privileges are typical of the person [who the client] thinks he might have a problem with; or to put it another way, the [client] has spent a lot of effort preventing [that person from] acquiring privileges." From there, Goldis will analyze everything from the features of mainframe security software to third-party extensions to operating systems.

Penetration testers also use many of the same ploys favored by outlaw hackers to break into systems, ranging from schmoozing unsuspecting employees in hopes of learning passwords to attempting to log onto a system using common passwords.

"It's a different way of assessing the adequacy of the system and, in my mind, a more effective way," said Peter Davis, a Canadian auditor who has used penetration testing firms. He asked not to be further identified to avoid tipping off those he regularly audits. "They know exactly what to look for."

When Davis hired Janus Associates, Inc., a penetration testing firm based in Stamford, Conn., the investigators uncovered a user identification and password that allowed them privileged access, Davis said. "They broke the system."

Good doublecheck

Companies that use penetration testing firms typically have a gamut of security controls already in place. Penetration testing is a way to make sure the controls work according to plan.

The services range from $2,000 for a two-day remote test to $30,000 for a one-week, customized, on-site analysis.

"We approach it from many different ways, either as an employee who is trying to breach unauthorized access or as a total outsider who knows nothing about the company, maybe as a computer hacker," said Scott Chasin, one of four founders of Comsec Data Security, Inc., based in Houston.

Chasin and two co-founders of Comsec, one of a handful of companies specializing in penetration testing, are former members of the Legion of Doom, one of the nation's most notorious hacker groups, according to federal law enforcers.

Chasin claimed to have a 100% success rate in breaking into the systems of Comsec's clients. He claimed that the firm could penetrate 80% of the systems in corporate America.

"Once we do penetrate, we try to grab things of value from the system to let [clients] know what somebody could have manipulated, stolen or damaged."

Not all security breaches are carried out electronically, said Patricia Fisher, president of Janus Associates. In one case, a Janus investigator succeeded in getting a user ID and password by sending the client company a letter that said, in part, Janus was working on a "project" and wanted the firm to participate in a "demonstration."

A new trend?

Just how popular penetration testing has become is hard to say. Firms that use such services are reluctant to admit it for fear of tipping off those whose systems are being scrutinized.

In many instances, the firms are hired by an auditor, board of directors or senior information systems managers. Those who are responsible for hands-on management or protection of computer systems are seldom told that outsiders have been hired to test security. "It isn't an effective test if everyone is forewarned," Davis said.

Penetration testing should always be conducted only after the "politics have been thought through," warned Harry DeMaio, director of information protection services at Deloitte & Touche in Wilton, Conn.

Those whose systems are being plumbed may be offended by what could easily be construed as a lack of faith on the part of management, he said.

Challenge, notoriety cited as impetus for virus developers

CONTINUED FROM PAGE 1

pens in the process," he claimed.

As an example of the type of viruses they write, the group took credit for writing the Bob Ross virus, named after the painter of the same name who hosts a painting show on Public Broadcasting Service.

"What it does is infect files and randomly displays 'Bobisms,' which are messages that Bob Ross would say," Hell Raiser said. "It doesn't format the hard drive or do any damage."

However, other alleged members of Phalcon/Skism later admitted to writing viruses that are clearly intended to damage or destroy programs and data.

The callers contended that they are virus "authors," not virus "spreaders," and that they are not responsible for the problems their creations cause.

"The main difference is that an author may write a virus and may even upload that virus to a virus board, a [bulletin board system] oriented to virus programmers and spreaders," one virus author explained.

"People, like a disgruntled employee who may have a gripe with someone else, download it and spread it that way," this virus author said.

Not lawbreakers

The virus authors also pointed out that since the act of writing a virus is not prohibited by law, they should not be viewed as criminals.

The callers claimed that even if the group stopped writing viruses, the number of infections would not decline. The problem of viruses has grown so large that new viruses have no impact overall, one said.

"Our effect is fairly little," he asserted.

The callers said they have been writing viruses for about a year and would probably continue for at least another year. Eventually, they hope to find jobs as full-time programmers, several said.

There is no way to verify the callers' claims. However, many of the monikers the callers used, as well as the name "Phalcon/Skism," have shown up in perhaps as many as half — about 100 — of the viruses to appear in the past six or seven months, said John McAfee, president of McAfee Associates, an antivirus software publisher based in Santa Clara, Calif.

The quality of the viruses is "mediocre," McAfee said.



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BORLAND

Software Craftsmanship

Sybase to reveal updated application tool kit

BY JEAN S. BOZMAN
CW STAFF

EMERYVILLE, Calif. — Sybase, Inc. is expected to announce a new version of its database application development tool kit today. The enhanced tool kit is said to offer users improved design capability and better memory utilization.

The improvements to Application Productivity Tools (APT) Workbench 5.0 are necessary because many Sybase users have already migrated to alternative tool kits, industry analysts said.

Among the many options are Uniface Corp.'s fourth-generation language and Unify Corp.'s Accell/SQL, which Sybase has offered since late 1990 via its third-party developers program.

The enhanced tool kit was designed to address some shortcomings that, according to Sybase users, limited APT's flexibility and use of available system memory. Sybase executives confirmed the APT 5.0 announcement but stopped short of giving prices and availability dates. "We've addressed portability across [many] character-based and GUI environments and focused on high performance and on the ability to gain access to heterogeneous databases," said Stewart Schuster, Sybase vice president of marketing.

Some analysts said that APT 4.0 is not as user-friendly as some other tool kits on the market. "The user interface was somewhat cryptic and convoluted," said Aaron Zornes, vice president of application development strategies at the Meta Group, Inc. in Stamford, Conn.

However, longtime users said they were accustomed to APT's current features. "I have found it to be comprehensive," said Tim Lass, project manager for Sybase development at the Phoenix-based Maricopa County Public Defenders Office, which runs APT on a Digital Equipment Corp. VAX.

Lass noted that the top five lines of each APT 4.0 screen are preformatted and cannot be used for programming — something he has been told will be repaired in APT 5.0.

Some users have chosen to program their Sybase applications without a tool kit, by writing them in C. "We're using OSF's Motif and C to program our applications," said Rick Borgen, who writes Sybase applications for Sun Microsystems, Inc. workstations at the Jet Propulsion Laboratories' Ground Data Systems group in Pasadena, Calif. "So, I'm inclined to think that a new version of APT would not make any difference to us."

But others are anticipating APT 5.0. "We've had some memory problems with APT 4.01," Lass said, "so we are looking forward to the new version."

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CA Unix push receives boost

BY MARYFRAN JOHNSON
CW STAFF

ISLANDIA, N.Y. — Computer Associates International, Inc.'s determined push into the Unix software market got an extra shove last week when ADP Dealer Services, Inc. selected CA's new Unix-based relational database to replace its current system.

The dealer services company evaluated database offerings from every major vendor, including Oracle Corp., Ask Computer Systems, Inc. and Informix Corp., before choosing CA-DB for Unix, a multiplatform relational database management system designed for commercial production applications. The CA database is replacing the firm's current Pick database from McDonnell Douglas Corp.

ADP Dealer Services, located in Hoffman Estates, Ill., supplies turnkey computer systems and services for automobile, truck and heavy equipment dealerships. It has more than 9,000 clients in North America and Europe. Automatic Data Processing, Inc. (ADP), its $1.7 billion parent corporation, ranks among the largest computing services firms in the country.

"Our selection was probably based on performance and business issues as much as on the functionality of the software," said Dave Gulick, vice president of information technologies at ADP Dealer Services' research and development center in Portland, Ore.

"This change is allowing us to do a lot of things we couldn't do in the Pick environment," Gulick said. These include improving ease of use and administration for ADP customers and adding new support for distributed applications and standard interfaces between application modules.

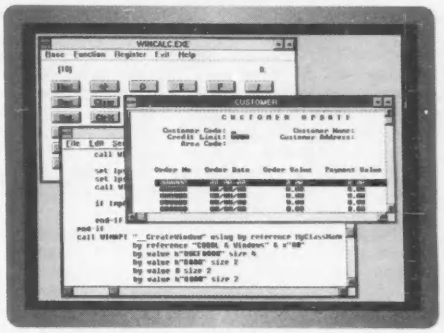
The company plans to gradually move 15 to 20 core Unix applications, which run on Motorola, Inc. 88000-based systems, from its Pick database into a client/server architecture. "We'll be enhancing our applications in a way that they'll be compatible with new and existing installations," Gulick said.

The applications range from basic general ledger to automated parts catalogs and auto technician scheduling systems.

The Unix-based version of CA-DB has been in beta testing since October 1991 on several midrange Unix platforms.

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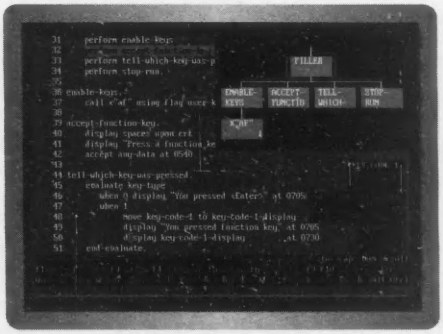
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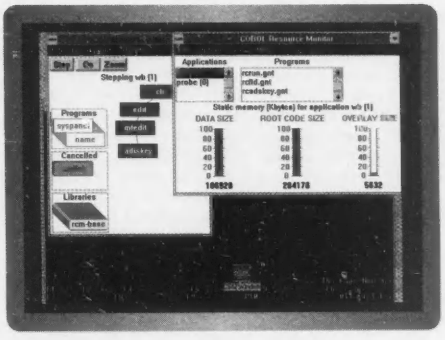
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GAO report red flags bank outsourcing

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The investigative arm of the U.S. Congress has issued a report that could lead to tighter controls on outsourcing by financial institutions, prompting users to worry that new regulations could hinder their ability to choose the best computer processing options.

In a survey of outsourcing vendors and financial institutions, the U.S. General Accounting Office (GAO) found that 38% of 150 computer services firms said they have entered into business arrangements with banks or savings institutions that include purchases of bank assets and stock, deposits and making and buying loans (see chart).

Banks, vendors and analysts said last week that most of these business arrangements are legal and aboveboard, but congressional and regulatory critics have charged that they can amount to "sweetheart deals" that unfairly exclude competition and can mask poor financial health by temporarily puffing up a bank's balance sheet.

The practices have become a target for regulators and legislators looking for ways to improve the soundness of the banking industry and the competitiveness of the computer outsourcing industry.

A Capitol Hill source said congressional action as a result of the GAO report was possible but unlikely this year. New rules or guidelines on outsourcing are more likely to come from the Federal Deposit Insurance Corp. (FDIC), he said.

Definitions vague

A number of vendors and customers said that what constitutes anticompetitive or unethical business practices is not well defined. However, Fred Cisewski, senior vice president and director of MIS at Atlanta-based Bank South Corp., which turned its processing over to IBM in 1989, said, "If it looks or smells unethical, it probably is."

Cisewski said reciprocal deals between banks and outsourcing companies are not necessarily wrong. "They should be able to stand on their own merits."

As for the possibility of additional government action, he said, "I don't know that you can write legislation that stops bad things from happening without also stopping legitimate things. I don't think anyone's smart enough to do that."

Although the GAO made no judgments about the meaning of the survey data, the agency reported that 22% of the vendor respondents doing work for banks said they had definitely or probably lost business to competitors willing to engage in non-data processing activities as a condition for winning the outsourcing contract.

Financial institutions said the congressionally mandated survey of 264 vendors and 3,353 financial institutions could spawn new laws or regulations restricting their freedom to contract out data processing.

"Any time Congress begins legislating business practices, I'm terrified," said Richard Huber, vice chairman of Continental Bank NA in Chicago. Continental outsourced its computer and network operations last year to IBM in a deal estimated to be worth $700 million.

"The FDIC is proposing regulations in this area that are very worrisome to the banking industry," said Charlotte LeGates, a spokeswoman for the National Council of Community Bankers. She said that small and midsize banks are increasingly turning to computer services vendors as the only way of getting the technology needed to compete with well-heeled financial giants.

"The report indicates there are some practices in this area that need dealing with," said Michael Jenkins, examination specialist at the FDIC. "But I don't think banks and vendors doing things on the up and up have anything to worry about."

Jenkins said that any new regulations would be oriented to greater disclosure of information, better records keeping and greater contract oversight by bank boards of directors.

"We think [the report is] a tempest in teapot," said Ian Macoy, federal representative at the American Bankers Association. "The tempest was stirred up by questionable practices in failed institutions, where there is more of an incentive to engage in the sort of questionable practices GAO is attempting to look at."

Macoy said resulting federal regulation could "hamstring banks, causing them to second-, third- and fourth-guess every contract and maybe even restrict acceptable business practices."

Sweetheart deals

Since Jan. 1, 1985, has your company had any of the following business relationships or transactions with any of the banks for which you provided data processing services?



Source: General Accounting Office

EDS to reap $508M from FAA Corn deal

Electronic Data Systems Corp. picked $508 million worth of corn last week, beating out Computer Sciences Corp. for the Federal Aviation Administration's (FAA) 10-year outsourcing pact, called Computer Resources Nucleus (Corn).

Dallas-based EDS will convert administrative and financial applications — some 11 million lines of Cobol — from the FAA's IBM and Data General Corp. environment to EDS' IBM data center in Plano, Texas.

EDS will run and maintain the systems over the term of the contract — five years plus five one-year options. An EDS official said new software development could be added to EDS' responsibilities later.

The contract does not include the FAA's operational systems, such as air traffic control, now being overhauled by IBM and others.

The FAA said Corn will improve response times, uptime and access to information, now curtailed by the current "capacity-limited system."

FAA's $508 million estimate of the value of the contract surprised industry observers, who said they had anticipated a deal worth something closer to $1.5 billion. Some said the far lower bid subsequently made by EDS was proof of the benefits of competition.

However, EDS said the FAA's second request for proposals was considerably "downsized," calling for the conversion of 110 systems instead of the original 250.

The applications EDS will take over include payroll, personnel, maintenance of aircraft records, pilot and crew certification and record-keeping associated with federal regulations and others.

GARY H. ANTHES

EDS/CA suit raises price consciousness

BY NELL MARGOLIS
CW STAFF

NEW YORK — The emotionally loaded legal battle between Electronic Data Systems Corp. and Computer Associates International, Inc. could bring to a boil a potentially more user-threatening software pricing issue that has been simmering beneath the surface of customer/supplier relationships.

EDS and CA are suing each other over alleged specific contract violations. Pricing in general is not at issue. Since EDS fired the first shot last month, however, users have been quick to relate the particular claims back to a general crisis: As technology, user needs and the economies governing both hurtle through change, old rules on what constitutes a fair price for software use are becoming irrelevant.

Vendors, panicked over the prospect that the new rules could wipe out their profits, are turning venal, users said. CA, many said, has taken that turn.

"When I heard that EDS had filed [suit against CA], my very first reaction was, 'Yes! It's about time somebody took a stand against CA's pricing policies,' " said Mark Jankowski, chief information officer at Dallas-based Pepsico Foods International at a Conference Board/Gartner Group, Inc. conference on information systems strategies held here last week.

Jankowski said he and many of his colleagues in the IS community do not dispute EDS' claim that CA's pricing amounts to price gouging. "I know they do it. I've seen them do it," he said.

CA — and every other firm that owes a sizable chunk of its revenue to pricey mainframe software — is reacting to the shock of seeing revenue growth stymied by data center consolidation, outsourcing and the swelling number of users moving away from large systems, users and analysts said.

Sympathy reserved

However, user sympathy is likely to be reserved for the threatened software vendors that refrain from wringing every possible cent out of whatever their licensing contracts allow, Jankowski said.

The EDS/CA suit and countersuit [CW, Jan. 13 and Feb. 3], have ripped the lid off the pricing controversy, said Howard Anderson, president of Boston market research firm The Yankee Group. "I think 'panic' is a fair word to describe what's going on" in both camps, he said.

Perhaps surprisingly, not all the panic on the user side stems from the ambiguities inherent in software pricing.

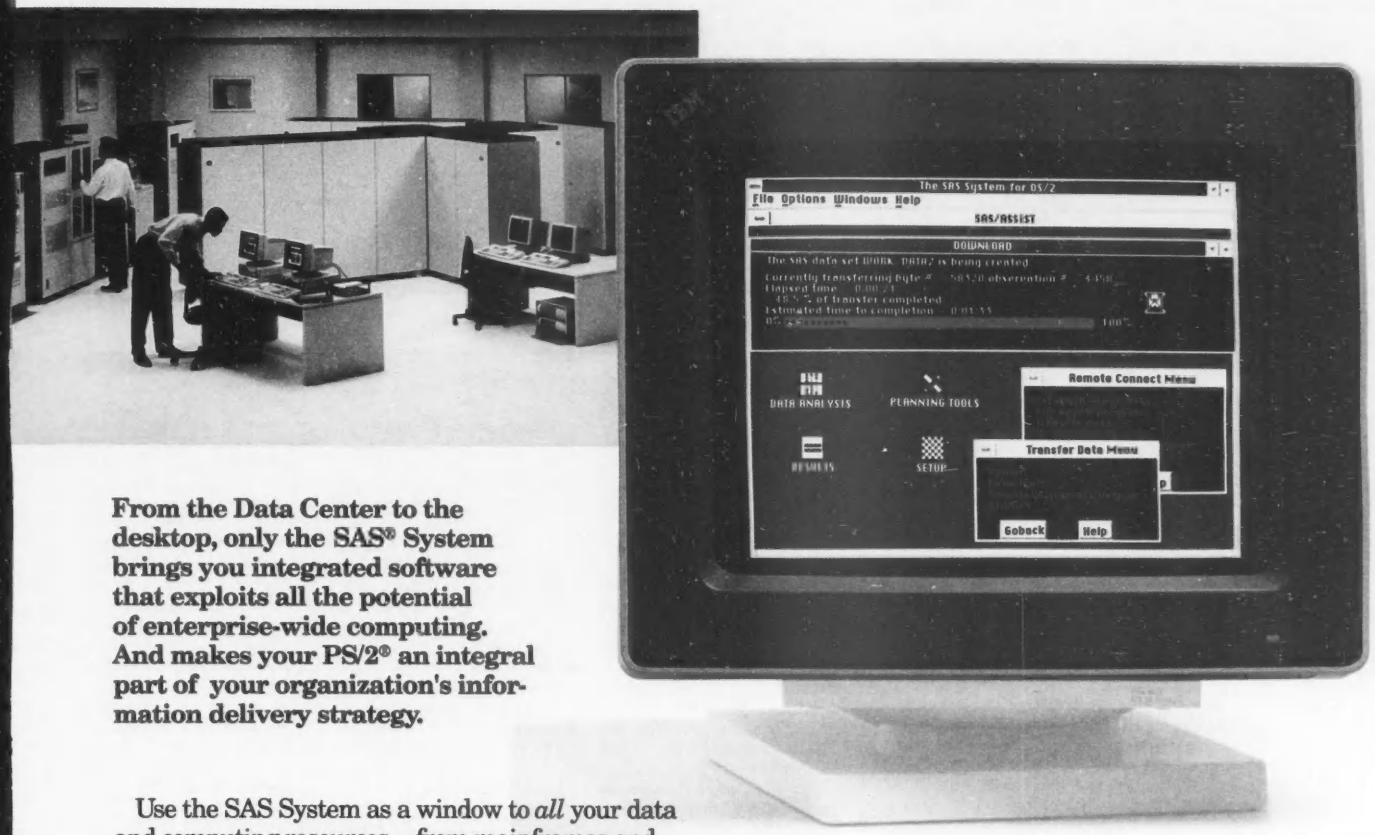
"The pricing issue definitely scares me — and what I'm scared of is that the arrogance of some of the vendors on this issue may spell disaster for many of them down the line," said Tom Reinhardt, director of cable information systems at United Artists Entertainment, Inc. in Los Angeles.

"What we sometimes tend to forget is, [users] have alternatives," he said. "I see a real possibility of more moves offshore for software development. There are some very inexpensive programmers to be found offshore who will build software to your own specifications."

In addition, he said, "There's always the alternative of doing it yourself." Only recently a preposterous suggestion for some firms, Reinhardt said, the possibility of bringing software development in-house is growing increasingly viable as "easy to use, complex development tools are on, or coming onto, the market."

"The sooner there's some resolution of the software pricing issue, the better," Jankowski said.

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NEWS SHORTS

CA plans Bachman link

Computer Associates International, Inc. is scheduled to announce today an interface between Telon, a code generator from Pansophic Systems, Inc., a company which CA acquired in October 1991, and tools from Bachman Information Systems, Inc. The new product, to be available immediately, reportedly lets users create applications with Telon, based on design specifications drawn from Bachman/Analyst.

IBM, National Semi cooperate

IBM and National Semiconductor, Inc. said last week they will share their respective Token Ring and Ethernet chip technologies with the goal of easing dual attachment of devices to both types of local-area networks. IBM's director of LANs, John McElroy, said that upward of 60% of IBM's Fortune 1,000 customers run both Token Ring and Ethernet LANs. Neither firm would discuss specific product plans or time frames.

Noonan in at SPSS

Chicago-based statistical software maker SPSS, Inc. announced the appointment of Jack Noonan as president and chief executive officer last week. Noonan, formerly president and CEO at Microrim Corp., a Seattle-based database developer, takes the post vacated by SPSS co-founder Norman H. Nie, who plans to remain chairman as well as to teach.

Miniscribe officials lose big

A jury hit officials and backers of Miniscribe Corp., which went bankrupt amid fraud allegations in 1989, with some $550 million in damages. Punitive damages awarded include $45 million against investment firm Hambrecht & Quist, Inc.; $250 million against Miniscribe head Q.T. Wiles; and $200 million against accounting firm Coopers & Lyband.

Congress criticizes telcos

A congressional report called on the Federal Communications Commission to mandate stringent, industrywide rules on network reliability for the nation's telephone companies. It said standards are lacking in some areas and are inconsistent across companies in others, raising concerns that the industry does not devote sufficient attention to service quality. Telephone holding company Bellsouth Corp. "categorically" rejected the study conclusions, but users hailed the report.

DEC offers development tools

Digital Equipment Corp. has introduced InstantSQL Version 1.0, an application development tool for RDB/VMS, DEC's relational database for production systems applications. DEC also announced shipment of more than 10,000 copies of CDD/Repository for VMS Version 5. The distributed repository, part of DEC's Network Application Support-based Cohesion software development strategy, enables users to organize, control and integrate tools and applications across an enterprise. Version 5 includes object-oriented A Tolls Integration Standard services to allow users to implement their own software development life cycle within the repository. On the hardware side, DEC added a DECpc 433 Workstation, which was designed to act as a network client for multitasking windows applications or as a stand-alone design station.

Short takes

Borland International, Inc. has unveiled details of its Borland Object Component Architecture, which is an object-oriented architecture built around the company's Interbase database engine and was designed to allow products from both Borland and third-party vendors to interoperate more readily using the Open Database Application Programming Interface ... Advanced Logic Research, Inc. cut prices up to 50% last week on its Powerpro server, a clone of Compaq Computer Corp.'s Systempro ... Arjan S. Khalsa, inventor of a $400 keyboard for people with cerebral palsy and other disabilities, won first prize in Johns Hopkins University's search for assistive technology.

DEC offers sneak peak at Alpha

Processors will have CMOS technology, clock speed of 150 to 200 MHz

BY SALLY CUSACK
CW STAFF

HUDSON, Mass. — Eager to prove that there is indeed a tangible product hidden behind the curtains, Digital Equipment Corp. last week offered several additional details on its next-generation, 64-bit reduced instruction set computing (RISC) architecture, Alpha.

DEC revealed that initial Alpha processors, which will be largely workstations, will incorporate DEC's CMOS-4 technology. The Alpha EV-4 RISC chips, which sources said will be unveiled next month, will operate at speeds ranging from 150 MHz to 200 MHz and will ship in all first-generation Alpha systems.

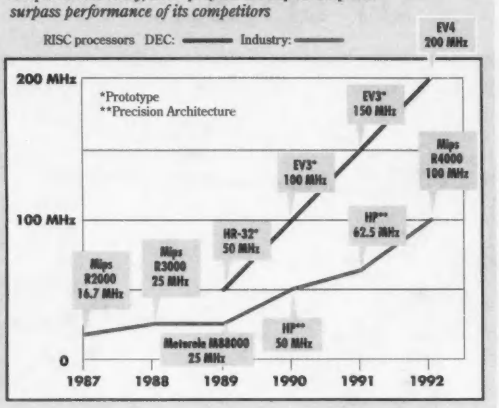
The keys to Alpha

The firm is incorporating key new technology into Alpha, including a very thin gate oxide, short channel length, lower voltage requirements and use of cobalt silicide in chip fabrication, according to R. J. Hollingsworth, a DEC corporate consulting engineer.

Most chip manufacturers are using titanium, which has limits in manufacturing, Hollingsworth said. Cobalt allows features to be scaled smaller, which allows for fast transistors and increased speed. The EV-4 will incorporate 1.68 million transistors, 8K bytes of instruction cache and 8K bytes of data cache and will provide 400 million instructions per second and 200 million floating point operations per second at a peak issue rate of 200 MHz.

Will RISC pay off?

Despite a late entry, DEC projects the Alpha Chip will surpass performance of its competitors



Source: Digital Equipment Corp.

William Sines, an analyst at Technology Investment Strategies Corp., a consulting and research firm based in Framingham, Mass., said the recent announcement makes it clear that DEC has jumped on leading-edge technology cycles. However, he cautioned that the company must keep a balance between design and manufacturing costs.

"It is such an expensive proposition to develop these chips that DEC will have to have success in the merchant marketplace. This is difficult for DEC — [as] they are already a member of ACE, it would be hard to create or join a chip consortium."

DEC is clearly banking its future on the success of Alpha, and customers have been watching the evolution of the architecture with interest.

"I think Alpha is going to be a big win for DEC," said Robert W. Forster, manager of DEC systems at the Sikorsky Aircraft Division of United Technologies, Inc. in Stratford, Conn. With its 30 DEC midrange systems and 300 to 400 DEC workstations, Sikorsky will most likely implement Alpha technology on single-user workstation platforms, Forster said.

Terry Shannon, a principal at Gander Resources, a consulting firm based in Ashland, Mass., said that existing DEC customers seem fairly confident that it will be as easy to migrate from the VMS to Alpha architecture as DEC has promised.

DEC reorganization paves the way for Alpha

CONTINUED FROM PAGE 1

organizations, although further changes are being contemplated, the spokeswoman said: "As the organizations combine under this new focus, redundancies and duplications" will be eliminated.

DEC is looking to bolster its financial health through the restructuring as it prepares to enter the cutthroat RISC processor market, analysts said.

"DEC wants to be on the leading edge of driving prices downward," said Peter S. Schay, vice president of midrange computing strategies at Gartner Group, Inc., a Stamford, Conn., consultancy. "This means that they will have to make ongoing changes in the organization over the next several years in order to get costs down [enough] to be an aggressive pricing company."

To ensure the company's continued vitality, DEC Chairman and President Kenneth H. Olsen intends to refocus the company around architectures, products and target markets. The company is said to be focusing resources on key architectures such as Network Application Support — internetworking software that drives its systems integration strategy — as well as products such as workstations and servers and key markets such as manufacturing, engineering and financial services.

One result, sources said, will be that DEC will slash its engineering budget by almost 25%, or approximately $400 million. DEC currently spends about $1.5 billion on engineering, according to a company document obtained by *Computerworld*.

Observers agreed that a 25% cut is indeed hefty, but none said they anticipated any customer problems arising from the refocusing moves. Larry Stiefvater, a DEC customer since 1977 and research principal at Kraft General Foods Research Technology Center in Glenview, Ill., said he does not anticipate any lessening of support from DEC.

"This will help DEC focus its resources," Stiefvater said. "It is ultimately a good move, but the bad part may be a loss of some good entrepreneurial efforts within the company."

Some sources predicted that DEC would lay off about 10,000 people in three months as a result of the restructuring. The DEC spokeswoman said those numbers are not "in the plan" for fiscal 1992 and declined to say how many pink slips would go out. The company said it was considering reducing its head count after it reported its second-quarter loss.

Warring PC vendors slash and burn prices

BY CAROL HILDEBRAND
CW STAFF

The machete wielders were out in full force in the personal computer industry last week, where no fewer than four vendors announced price cuts ranging from 5% to 38%. Users are rubbing their hands in glee at the prospective bargains expected to result from the continued bloodletting.

Analysts said that the latest blitz from Dell Computer Corp., Apple Computer, Inc., Digital Equipment Corp. and Zenith Data Systems kicks off another year of savage pricing competition among PC suppliers.

"Obviously, the overall trend is toward commoditization as pricing becomes the primary criteria in PC purchases," said Matthew Cain, an analyst at Meta Group, Inc. in Westport, Conn. As vendors respond to that pressure, some users are able to buy up.

"We're going straight to buying 486s for all of our workstations," said John Biglin, PC coordinator at General Waterworks Management & Service Co. in King of Prussia, Pa. "We're buying time here: a better and faster system for only 300 bucks more."

"In a word, outstanding," said Anthony Best, a data processing procurement analyst for the state of Mississippi. Best said that the price slashing will enable him to stretch state dollars, already in short supply, that much further. He particularly cited Dell, saying that its reductions put the Austin, Texas, company in a very competitive position price-wise with such vendors as Everex Systems, Inc. and Datatech Enterprises Co.

Analysts said that both Dell and Apple were due for a pricing action. In Dell's case, Cain noted, "They generally wait until the competition drops prices and then try to go a couple percentage points below them."

With Apple, it was a matter of getting its low end in tune with the Quadra line, analysts said. "As soon as the Quadra came out, price cuts [at the low end] were inevitable," said Joe McGlone, a principal at McGlone & Co., an investment research firm in Westport, Conn.

Dell led off with cuts of up to 38% across its full line of products, while Apple cut much of its low-end line.

Bloodletting

A veritable who's who of PC vendors reduced prices last week

Company	Range	Example
Dell Computer Corp.	4%-38%	486D/33 MHz, 8M-byte memory was $4,799, now $3,599
Apple Computer, Inc.	9%-37%	Mac IIFX 4M-byte memory was $8,069, now $5,799
Digital Equipment Corp.	5%-35%	433-486 33 MHz was $6,699, now $4,999
Zenith Data Systems	5%-26%	Mastersport 386SL laptop was $4,499, now $3,449

Source: Company reports

Grid prepares for portable wars

BY JAMES DALY
and MICHAEL FITZGERALD
CW STAFF

FREMONT, Calif. — Grid Systems Corp. is expected to shift its portable computer business into a higher gear late next month when it unveils two new machines, including a pen-based system that can be strapped onto the user's forearm.

Grid will move into overdrive by midyear with a veritable library of products, among them an updated version of its Gridpad pen-based system and a lightweight "pentop" personal computer that integrates handwriting-recognition capabilities with the functions of a traditional portable machine, sources said.

The unveilings are expected to begin March 23 with a pen-based model priced at about $1,500 and weighing under 3 pounds. It will be powered by Intel Corp.'s 8088 chip and will include straps, allowing it to be mounted on a user's forearm. Norand Corp., a Cedar Rapids, Iowa, portable systems vendor, is reportedly Grid's first customer. It is expected to resell the system to the distribution industry.

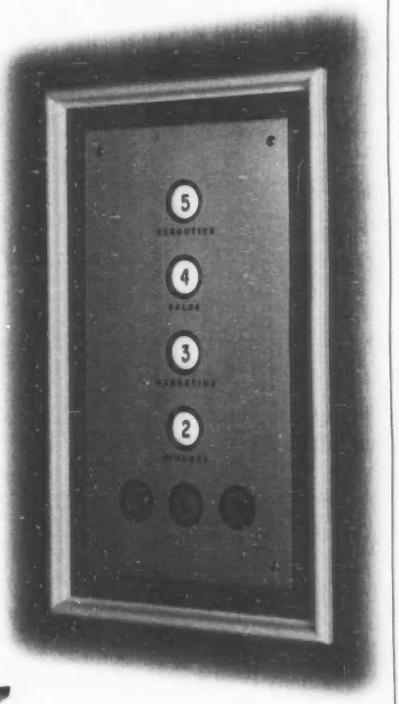
The wrist-mountable system poses a question: Will users warm up to the idea of carrying a machine that weighs as much as a small dictionary on their arms? Analysts said yes — in some situations.

"Anything that's lighter than their current 5-pound pen machine will be popular," said Nicholas Baran, editor of "Pen-Based Computing," a newsletter in Sandpoint, Idaho. "But the 8088 could turn out to be a weak point — for vertical markets like forms entry it will be fine, but it's not going to meet the power needs of many users after that."

On March 30, the company is expected to reveal a new 5.9-pound notebook based on Intel's 20-MHz 80386SL microprocessor. The machine will feature a full-size keyboard and a 10-in. screen, according to sources.

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IS questions Novell enterprise management

Central control of Netware servers a plus

BY ELISABETH HORWITT
CW STAFF

SAN JOSE, Calif. — Novell, Inc.'s Netware Management System will likely win the hearts of users seeking centralized management of their Netware servers, but it may not get the call from managers of enterprise networks.

"If I was a Novell shop with 10 Netware servers, I'd say this was great," said John O'Laughlin, premise-area network manager at McDonald's Corp. He pointed to such Netware Management System features disclosed last week as the graphical display, the monitoring of memory use and disk space and the ability to bit-map a building's floor plan and then automatically enter changes with a network configuration monitoring tool.

However, O'Laughlin objected to Novell's refusal to "go the whole nine yards" in supporting Simple Network Management Protocol (SNMP) — a de facto standard that McDonald's needs to manage its burgeoning IBM RISC System/6000 and Ethernet installations. The company is seriously considering Hewlett-Packard Co.'s SNMP-based local-area network management system, Openview Network Node Manager, he added.

While Netware Management System will be able to manage a range of SNMP-compatible devices, third-party vendors will need to use Novell's tool kit and proprietary application programming interfaces (API) in order to take full advantage of SNMP's mapping and other capabilities, Novell spokesman Duane Murray said.

Novell considered "basing the platform exclusively on SNMP protocol but concluded that it does not have the security services users need," Murray said. Novell's IPX protocols and Netware Loadable Modules constitute a standard in their own right, he added.

Novell denied any aspirations of competing against "manager of manager systems" that oversee everything from host networks to LANs to telecommunications equipment, such as IBM's Netview and Digital Equipment Corp.'s Enterprise Management Architecture.

However, the new system is definitely going head-to-head with products such as HP's Openview Network Node Manager, Cabletron Systems, Inc.'s Spectrum and Ungermann-Bass, Inc.'s (UB) Netdirector.

Several network managers seemed less than delighted at having yet another integrated LAN management system to evaluate for their companies.

"I would love a system that manages everything that Novell supports, but Novell isn't the glue for all our equipment, not the solution for everything," said David Wetzel, a telecommunications engineer at Syntex Corp.

The company uses Netview for its IBM networks and UB's Netdirector to manage UB hubs. However, it needs a management platform that can manage a hodgepodge of Ethernet, Transmission Control Protocol/Internet Protocol and Sun Microsystems, Inc. installations as well, according to Wetzel. "It takes a lot of time to learn a whole new management system."

Users also asked how Novell planned to integrate the platform with the management systems of two of its partners: IBM and HP. Novell's Netware and IPX protocols already send alerts automatically to IBM's Netview, Murray said. However, Novell has no plans to provide a link whereby Netware Management System can act as an element manager that passes alerts and commands between Netview and its own managed LAN systems, he added.

HP and Novell have already announced plans to jointly work on APIs and other means of integrating their respective management systems, an HP spokesman said.

Minor failings aside, Novell's platform has more going for it than many of its rivals started out with, including a solid set of functions and applications, open interfaces and workable tool kits for third-party support, as well as a broad group of initial third-party supporters, according to Janet Hyland, director of network strategy research at Forrester Research, Inc.

At least two dozen assorted hub, adapter, workstation and network management application vendors have committed to supporting the platform (see box above).

Pledges of support

While 50 companies verbally acclaimed Novell's Netware Management System last week, not all have committed to supporting the platform. What follows is a sample of vendors in various industry sectors that have made such a commitment:

LAN adapters and intelligent hubs: Synoptics Communications, Inc., HP, Gateway Communications, Inc., Pivotal Technologies and Proteon, Inc.

Uninterruptible power supplies: American Power Conversion Corp.

Network management applications: Blue Lance, Brightwork Development, Inc., Frye Computer Systems, Inc., Dolphin Networks, Remedy Corp. and Network Genéral Corp.

Servers/workstations: Compaq Computer Corp.

Network manager building blocks

Novell's Netware Management System comprises the following components:

- Netware Services Manager V.0.
- Graphical user interface based on either Microsoft Corp.'s Windows or OS/2 Presentation Manager.
- Applications for monitoring performance, configuration and status of peripherals, Netware Loadable Modules, servers and workstations.
- User-definable thresholds.
- Netware Management Map, which automatically keeps track of the configurations of network devices, servers and workstations and portrays them on a topological map.
- Availability: April 1992.
- Price: $4,995.

Netware Management Agent has these features:

- Netware Loadable Modules that provide configuration information, alerts and alarms about Netware 3.X servers to Network Services Manager applications.
- Open specifications and tool kits that enable other vendors to develop their own agents to report detailed configuration data to the Netware Management System.
- Availability: April 1992.
- Price: $495 per server.

The optional Netware Management Enhanced Map comes with these features:

- Automatic mapping of IPX-based network systems as icons on a bit-mapped image of a building floor plan.
- Automatic discovery of Internet Protocol routers and Novell Hub Management Interface hubs.
- Monitoring of devices that incorporate SNMP agents.
- Availability: July 1992.
- Price: $1,995.

Notebooks gain key desktop features

CONTINUED FROM PAGE 1

ducement for users to employ them on the desktop.

The general consensus is that the new notebooks are moving in the following directions:

- Lighter weight. Sources said the Safari will weigh less than 5 pounds, with batteries, and other vendors are shaving significant amounts of weight off their notebooks. NCR declined comment on this point, however.
- Smaller size. Notebooks will actually become slightly smaller than 8½- by 11 in. but will feature larger screens, as do Compaq Computer Corp.'s new LTE Lites. They will also be thinner.
- Longer battery life. Low-power and power management chips such as Intel Corp.'s SL line and Advanced Micro Devices, Inc.'s SXL will bring ever longer battery life to portables. Sources said the Safari will have eight hours of battery life, using a 25-MHz SL and new power management features.
- New floppy formats. Vendors will cut size and weight by dumping standard 3½-in. floppy drives in favor of Personal Computer Memory Card Industry Association (PCMCIA) flash cards.

These thin memory chips are already utilized by Toshiba, which uses them for random-access memory upgrades and for modems on its T2200SX notebook. The new Safari will come standard with a PCMCIA slot in place of a floppy.

- More functions. Analysts predicted notebooks with small computer systems interface (SCSI) and special options, including radio frequency and cellular communications facilities. Both are options on the coming Safari, though it will not have a SCSI.
- Better networkability. The Safari, for instance, will have an optional Attachment Universal Interface that will allow it to connect directly to a variety of networks without an expansion station.

User reactions to the upcoming systems were generally positive, though some are unwilling to pay high premiums for increased features.

"We want to move our users off desktops and onto notebooks, so anything that increases the power and functionality of the notebook is really important to us," said Sheldon Laube, national director of information technology at Price Waterhouse.

He said he was pleased to hear that SCSI technology will likely soon appear on notebooks and added that his firm would pay a premium for notebooks with advanced features, as did several other users contacted.

> "YES, WE WANT them to be faster, yes we would like more stuff on them, but we are not willing to pay more."
>
> PAUL NELIS
> CAISSE NATIONALE

Others disagreed. "Yes, we want them to be faster, yes we would like more stuff on them, but we are not willing to pay more," said Paul Nelis, a programmer at Caisse Nationale de Credit Agricole in Chicago. "Notebooks are designed for a different function and don't need to be as powerful as a desktop."

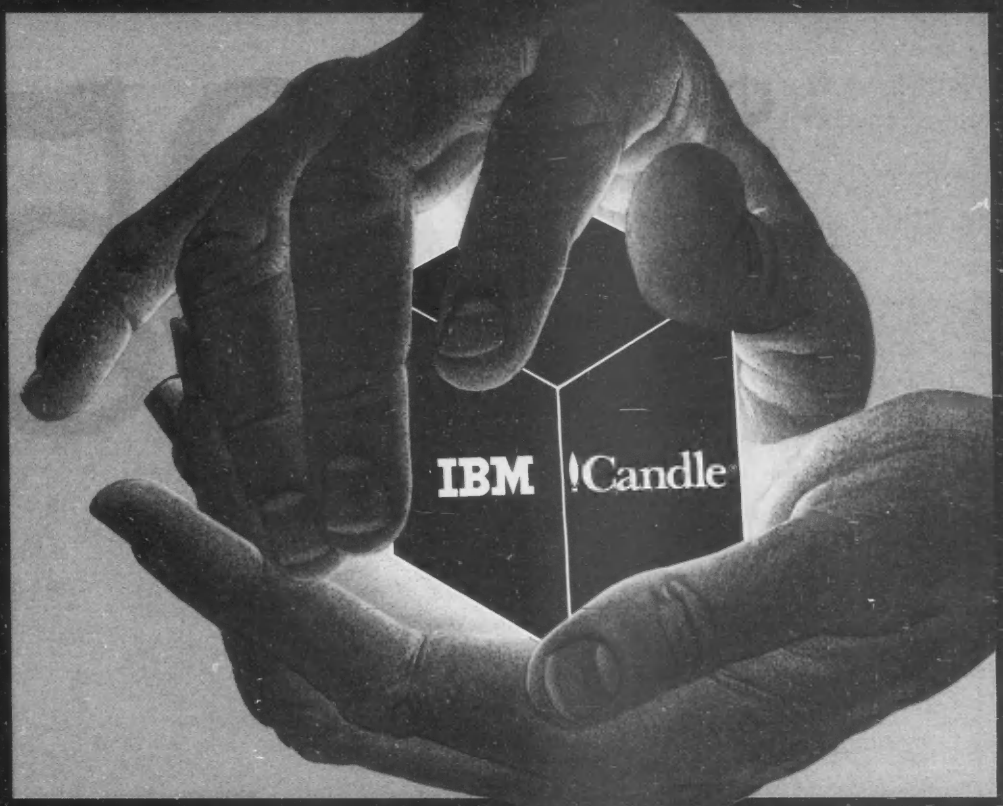
That attitude could hurt the Safari, expected to command premium pricing in excess of $5,000 when it hits the market.

Industry observers said the push to replace the desktop with laptops is being legitimized as users begin to question the wisdom of paying for both a desktop and a notebook machine.

Anthony Best, data processing procurement analyst at the Bureau of Data Processing for the state of Mississippi, said that some of his people use their laptops both in the field and in the office. In these cases, he said, "We would be willing to pay a few extra dollars, since in essence we would be buying two machines for the price of one."

Staff Writer Carol Hildebrand contributed to this report.

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HEWLETT PACKARD



Intel injects dual-clock speed into I486 successor

BY MICHAEL FITZGERALD
CW STAFF

SANTA CLARA, Calif. — In early March, Intel Corp. will announce a new version of its I486 chip that features a special dual-clock speed and ease of installation for users who want to upgrade systems with it, according to sources.

This first P24 will reportedly operate at a 25-MHz external clock speed and a 50-MHz internal clock speed. Intel will follow in the May-June time frame with a second version of the P24, which will run at a 33-MHz external clock speed and a 66-MHz internal clock speed, sources said. The second chip will outperform the 50-MHz 486DX and top out the 486 line.

Intel has discussed the P24 publicly for months, focusing on its power and ease of installation, but last week refused to comment on product specifics.

Later in the year, Intel will introduce the 586, officially known as the P5, with a clock speed of 66 MHz. Sources said it will follow that with a dual-speed P5 that will run at 66 MHz outside and 133 MHz inside.

Users were skeptical of the chip and somewhat suspicious of the clock-doubling concept.

"I would like to see products come out that are the brainchild of engineering departments rather than marketing departments, and this smells like maketing has had too heavy a hand," said Wayne Munn, architecture group planner at a large Midwestern food company.

"The price curve favors those who go out to buy new machines, so as an upgradable thing I'm skeptical, but it may offer some benefits on the performance side, as long as manufacturers don't go the high road in terms of price," said Gerard M. Nussbaum, MIS director at Premier Hospitals Alliance, Inc. in Westchester, Ill.

Despite the performance gains and expected immediate availability of systems, users did not see buying P24-based systems right away.

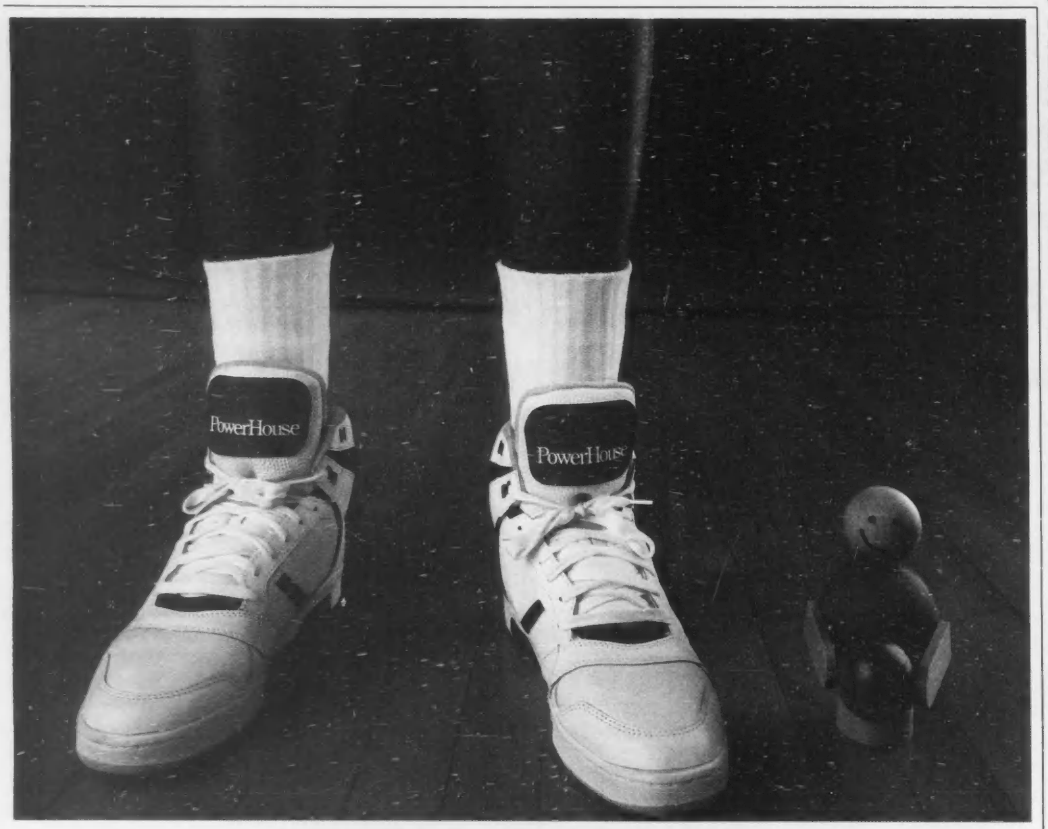
"Maybe in a year or so it'll mean something to me," said William Tignanelli, assistant vice president of the Federal Reserve Bank in Baltimore. He said the Federal Reserve was only using 486s as file servers right now and upgradability was not an issue, but he thought the increased power could be important for 1993 purchase plans.

Analysts agreed the chip and dual-speed concept will find it slow going for a while.

"It's gradually going to be an important factor, although [the number of] users who will take advantage of the user-installable upgrade aspect I think will be relatively small," said Dick Shaffer, head of consultancy Technologic Partners in New York.

Intel has been pushing the P24 as an upgrade path for users of 486SX-based systems designed with the Intel-specified Performance Enhancement Socket (PES). Intel said more than 50% of its vendor customers have adopted the PES architecture, which lets users plug a P24 into a separate socket, automatically disabling the extant processor in favor of the more powerful chip.

Among vendors who have adopted this architecture are IBM, Compaq Computer Corp., Dell Computer Corp., Hewlett-Packard Co., NEC Technology, Inc., AST Research, Inc., Everex Systems, Inc. and Advanced Logic Research, Inc.



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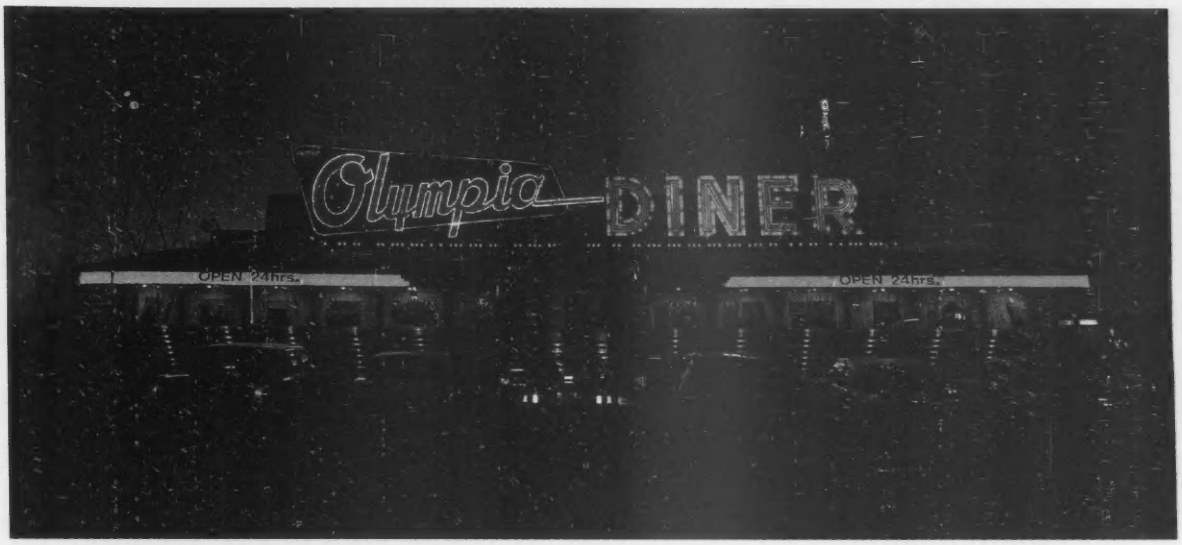
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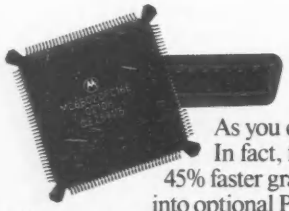
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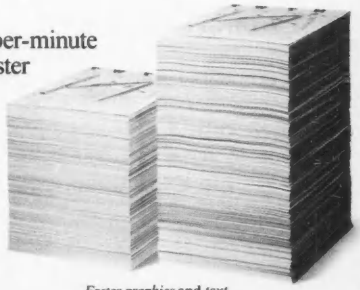
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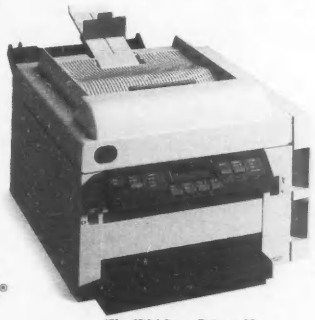
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Revlon makes over IS unit, outsources to Andersen

CONTINUED FROM PAGE 1

the Andersen partner said.

The innovative pact — which aims at freeing Revlon's core IS team to focus on the transition to a new platform and a new IS culture with minimal disruption to the company's business — is being viewed by Andersen and by industry observers as an example of the "transitional outsourcing" mode that, according to Andersen managing partner Rudy Puryear, will be increasingly pursued by users out to maximize business effectiveness through IS rather than merely cut costs.

"To date, short-term financial arguments have dominated the [outsourcing] discussion," Puryear said at a management conference last week in New York sponsored by Boston-based market research firm The Yankee Group. "In the future, as [user] emphasis shifts to capability and performance, the question will shift from 'Should we outsource?' to 'How should we outsource?' "

When that becomes the question — an investigation Andersen dubs "multisourcing" — the transitional outsourcing contract will become a frequent answer, Puryear said. The Revlon deal, Andersen partner Gerald Rydberg said, is a prototype of how and why.

"Revlon didn't start as a multisourcing negotiation," he said. "It started as a conventional outsourcing bid, with us and ISSC" — IBM outsourcing subsidiary Integrated Systems Solutions Corp. — "as the finalists."

Midway through the bidding process, however, Revlon North American President Michael Hammond "came up with a different idea," Rydberg said. "He wanted to go to HP minicomputers as soon as possible, and he didn't want a five-year deal. He wanted a two-year deal to allow for the transition."

Several industry observers agreed that multisourcing and transitional outsourcing — whether by these or similar names — are likely to gain currency, particularly as companies attempt Revlon-style IS makeovers in droves.

However, some query whether Andersen espouses the strategy not because megadeals are unsuited to users but because they are eluding Andersen.

Five months ago, The Yankee Group noted the growth of the outsourcing arena not only in size but in strategic importance and summed up Andersen's prospects in that arena:

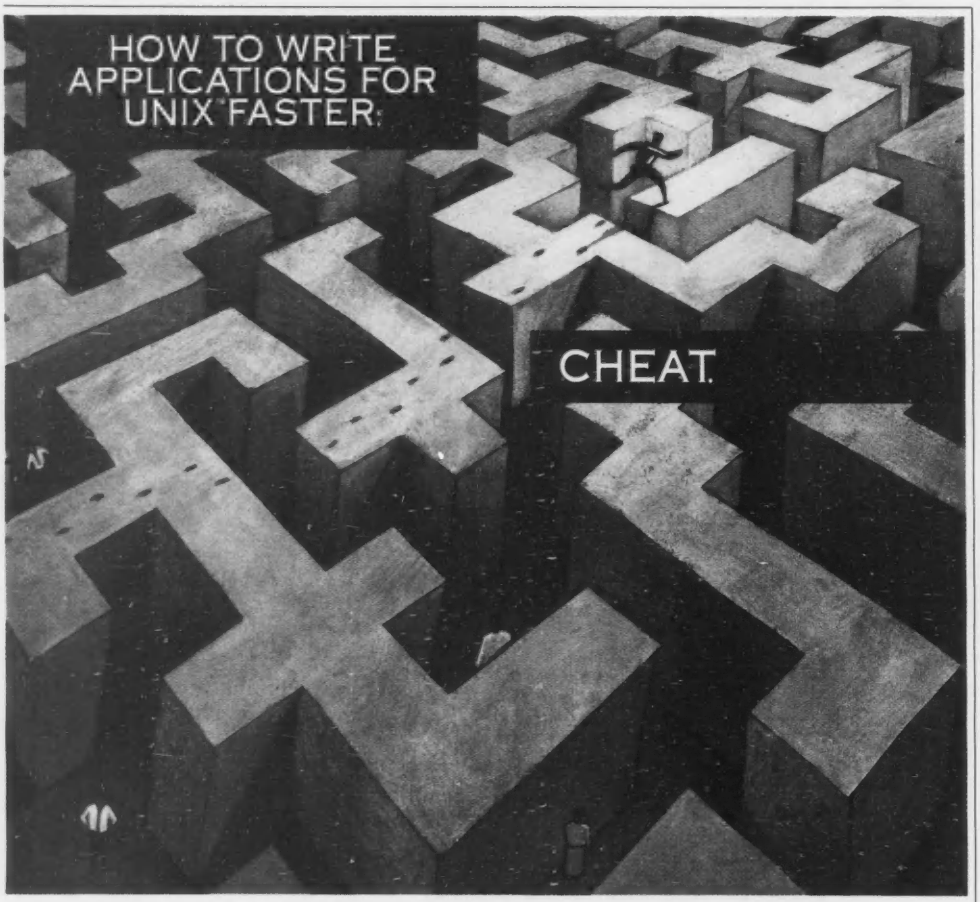
"Andersen Consulting has hit a lot of singles and one double" — a $200 million, 10-year full-tilt outsourcing contract entered into in late 1990 with Sun Co., a subsidiary of oil company Sun Refining and Marketing Co. — "but it is going to have to hit for power — a home-run megadeal. Either that or string a bunch of singles together to produce some winning runs."

Has Andersen, unable to do either, opted instead to simply redefine the game?

"I think the whole multisourcing, transitional outsourcing [push] is a defensive strategy. No question," a former Andersen partner said. "This is Andersen being creative in the face of being closed out of the kind of deals IBM and EDS are positioned to pull off.

But that doesn't mean it isn't a good idea," he added. "I believe it is."

While he conceded that Andersen would be wasting its time and resources "competing with other firms on their ground," Rydberg disagreed with the characterization of his firm's agenda as defensive. "I think it's fair to say that our strategy, like the outsourcing market itself, is still evolving," he said.



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Toshiba remakes notebook modem

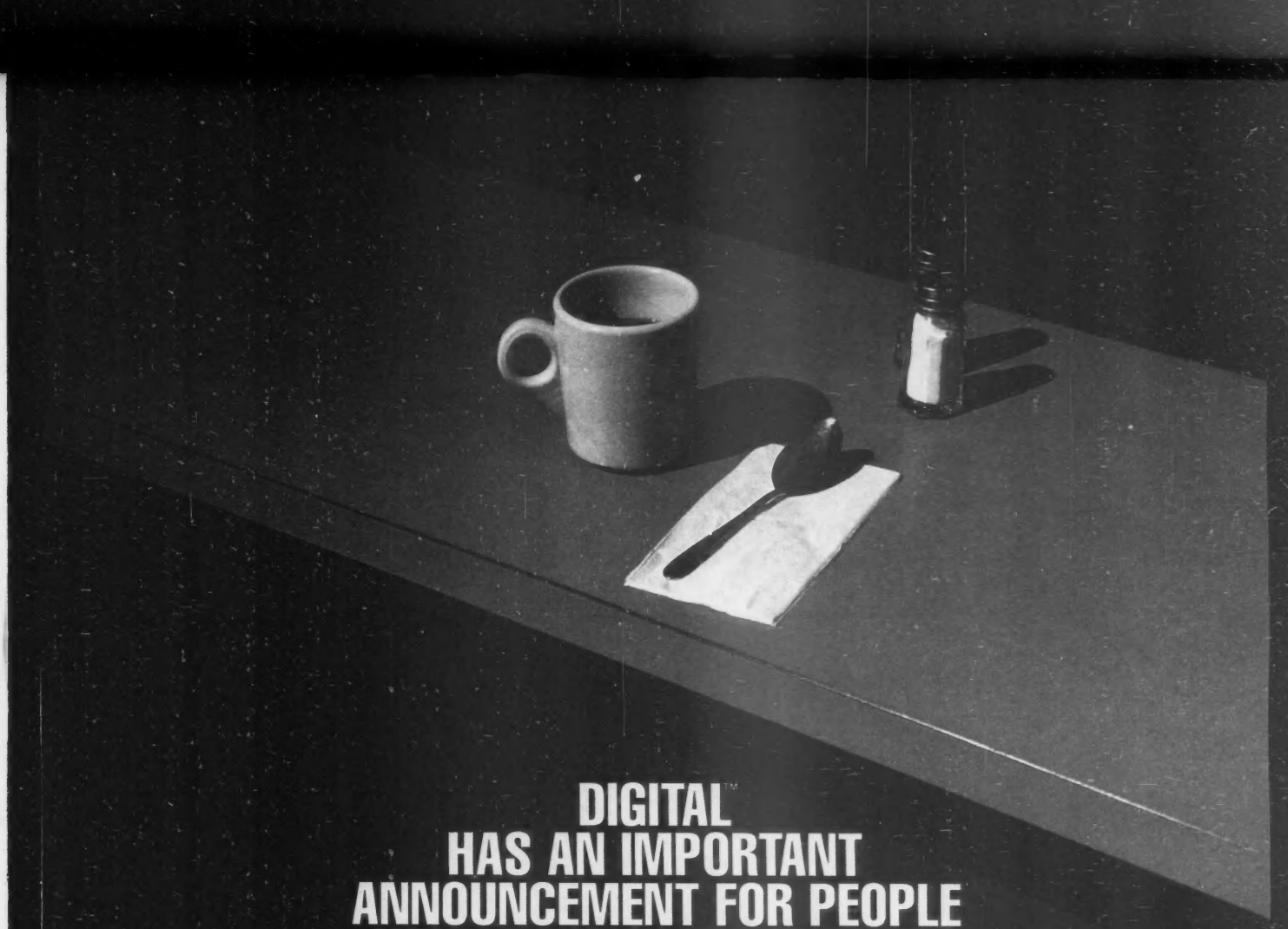
IRVINE, Calif. — Toshiba America Information Systems, Inc. last week said it has developed a modem for its T2200SX notebook computer to replace one that caused users grief.

Hugh Faulkner, manager of communications products at Toshiba, explained that the system's original modem cards worked but were difficult to extract from the slot. Toshiba decided to postpone shipping them.

Authorized resellers will receive modem replacements as early as the middle of this week. The T2200SX, introduced late last year, has had few buyers so far. One user who said he will continue to buy the the modems said he is not pleased about having to wait for them.

"This is very typical of Toshiba, but it's a great machine," said Joseph W. King, assistant vice president at Continental Insurance Co.

Toshiba also said it expected to fill back orders for its Deskstation IV expansion station by March 1. Toshiba attributed the delay in shipping the Deskstation IV units to customers ordering them in large quantities.



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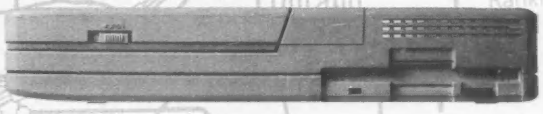
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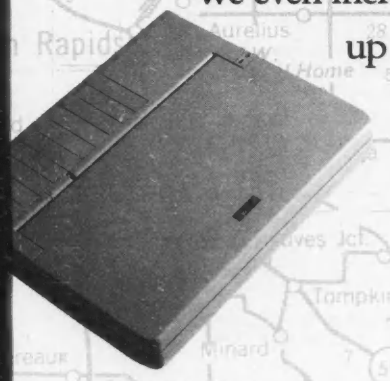
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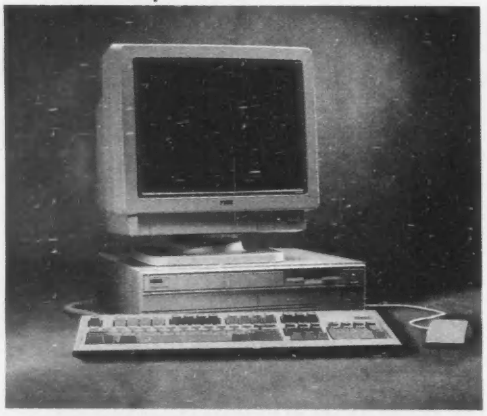
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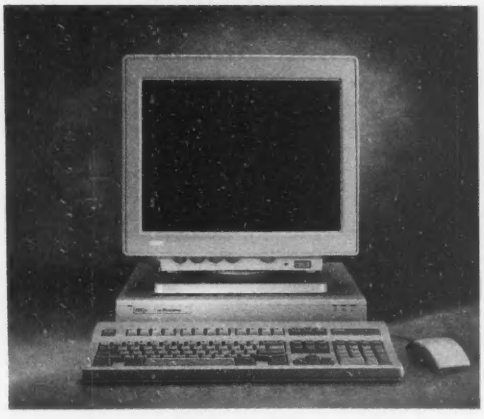
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- ☐ E-Mail
- ☐ Other industry-specific applications (please specify)

How many people work in your group, department or small business?
☐ Less than 10 ☐ 10-20 ☐ 20-35 ☐ More

Is your operating system:
☐ DOS ☐ DOS with Windows ☐ OS/2 ☐ MAC ☐ UNIX™ ☐ Other

Which of the following graphics-oriented applications best describes your needs? (Check all that apply)

- ☐ Desktop Publishing
- ☐ CAD/CAM
- ☐ Realtime Modeling
- ☐ Animation
- ☐ Image Processing
- ☐ AutoCad
- ☐ Business Graphics

LAN Communication

How many PCs do you have installed?_____ From how many manufacturers?_____

What kinds of connections does your PC(s) require? (Check all that apply)

- ☐ Links with other PCs in the immediate surroundings
- ☐ Connection to the local area network (LAN) throughout a building
- ☐ A line to a host system in a remote location

What kind of media (cable) is used in your LANs today?_____

What is the networking software now being used in your company?_____

What kind of host system will your PC communicate with?
☐ DEC ☐ IBM ☐ Other_____

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☐ Training ☐ FAX Hotline

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Do you currently have a service contract(s) for your PCs? ☐ How many?_____

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ADVANCED TECHNOLOGY

TECH TALK

Compression pact

■ Iterated Systems, Inc., based in Norcross, Ga., said recently that it has licensed its fractal compression technology to Microsoft Corp.'s multimedia publishing group. Microsoft will use Iterated's still-image fractal compression in its multimedia products. It offers the highest usable compression on the market, said Greg Riker, multimedia publishing group director of product development. Fractal images decompress quickly, without the lag noticeable with other technologies, he said, adding that the images are "softer and more pleasing to the eye" than images compressed with other methods.

Desktop news department

■ Mainstreet Newscast is a new broadcast information service that delivers news from Associated Press, Knight-Ridder and other wire services via FM radio and satellite to Apple Computer, Inc. Macintosh computers. The service, which is being marketed by Mainstream Data, Inc., works in background mode while the user performs other processing tasks. Software, FM antenna or satellite dish and Mainstream's Intelligent Data Receiver, which receives signals and formats them for use by the computer, are required. Prices for software and hardware are $495 for FM service and $990 for the satellite option.

Computers on campus

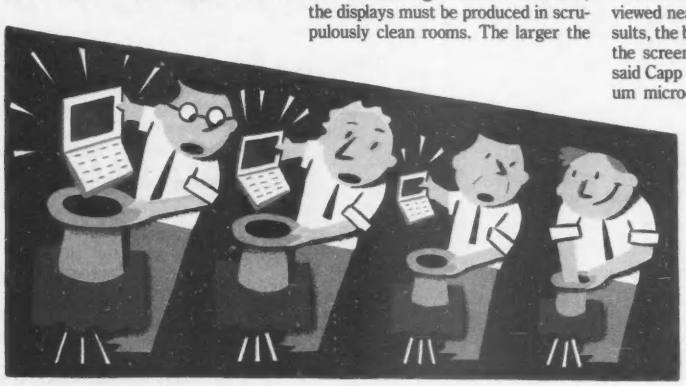
■ The University of Michigan and IBM are expanding the Institutional File System (IFS), a project designed to provide a campuswide distributed computing environment. IFS gives students, faculty and staff access to networked research, instruction and administrative data resources from any computer on campus. The expansion follows a successful first phase that incorporated file server code from Transarc Corp. on IBM's MVS/ESA, AIX/370 and VM/ESA operating systems.

High hopes for flat-panel displays

Worldwide market for AM-LCDs to increase a hundredfold in the next four years

BY MICHAEL ALEXANDER
CW STAFF

Flat-panel displays have the potential to be as ubiquitous as microprocessors, destined to appear in such places as a notebook computer with a talent for multimedia and wall-size television sets that hang like paintings.



Richard McQuire

The worldwide display market for active-matrix LCDs (AM-LCD), the hottest area in flat screens, is expected to climb a hundredfold in the next four years — from 300,000 units in 1991 to 30 million in 1995, according to an executive at Toshiba Corp., an AM-LCD maker. The average price per screen is expected to fall from $2,000 in 1991 to about $400 in the same period (see story below).

AM-LCDs react more quickly and produce higher resolution images than the older, passive-matrix models often used on many personal computers.

The displays get their sparkling qualities from a grid of thin-film transistors (TFT), which turn individual pixels on or off when a voltage is applied to horizontal and vertical electrodes.

The approach is not without drawbacks, however. The large number of transistors contained in TFT LCDs comes with a higher failure rate. Also, the displays must be produced in scrupulously clean rooms. The larger the area of glass in LCD screen, the harder it is to keep out dust and dirt particles.

As a result of those and other difficulties, flat-panel display makers are constantly on the lookout for alternate technologies that may provide a brighter future.

For example, last October, Canon, Inc. stunned rivals when it announced that it had developed a prototype of a new kind of AM-LCD called the ferroelectric LCD (FLCD) and that it planned to start producing in 1993. The panel is larger, sharper and far easier to produce and will be a low-cost alternative to other displays, Canon said.

However promising, FLCDs trade off one set of manufacturing problems for another, said David Marvin, vice president of sales and marketing at Troy, Mich.-based Optical Imaging Systems, Inc. FLCDs will not be on the market for at least five years, he said.

Furthermore, AM-LCDs must be viewed nearly head-on for the best results, the brightness is inadequate, and the screen must be backlit for color, said Capp Spindt, director of the vacuum microelectronics program at SRI International in Menlo Park, Calif.

Spindt is the inventor of the field emission emitter, a technology that many experts now believe could be used to produce flat-panel displays that are brighter, lighter, cheaper and more energy-efficient and have a wider viewing angle than AM-LCDs.

In a field emission display, millions of conical-shaped emitters or microtips are mounted on chips and positioned to poke through holes in a conducting film. Small amounts of voltage between the tips and the conducting film create an electric field strong enough to allow electrons to tunnel out of the tip. When a microtip is placed underneath a phosphorescent screen, the electrons leaving the tip form a tiny bright spot on the screen. That collection of dots, or pixels, makes up the image.

LETI, an electronic laboratory run by the French atomic energy commission, already has demonstrated a microtip prototype, 6-in. (diagonal measurement) CRT only 2mm thick.

U.S. to topple Japan in AM-LCD market?

BY MICHAEL ALEXANDER
CW STAFF

Japanese firms, led by Sharp Corp., Toshiba Corp., Hitachi Ltd. and NEC Corp., have poured some $2 billion into developing and making active matrix LCDs (AM-LCD). In comparison, U.S. investment into AM-LCD technology has amounted to nickels and dimes.

However, the U.S. can still catch Japan in the race to manufacture AM-LCDs, despite Japan's formidable head-start, according to the Japan Technology Evaluation Center (JTEC). JTEC, headquartered at Loyola College in Baltimore, is funded by the National Science Foundation and other federal agencies.

During a tour of Japan last fall, a JTEC research team found the Japanese are encountering "really tough manufacturing problems," said Duane Shelton, a JTEC manager. "Yield is only 4% to 50% for the most advanced color displays, nowhere near commercial level."

The manufacturing difficulties and the fact that U.S. laboratories are probably ahead of the Japanese in research provide an opening for U.S. companies to catch up and perhaps leapfrog Japan, the JTEC team said in its report. "Catching up could prove crucial to U.S. computer makers who want to stay ahead in the laptop, notebook and other portable computer businesses."

The main obstacle is that the U.S. has not invested in AM-LCD despite the fact that it is the technology of choice for the next generation of laptops, JTEC said.

The U.S. Commerce Department ruled in July 1991 that manufacturers of flat-panel displays were dumping their products in the U.S. The agency imposed a prohibitively high tariff to limit import Japanese-made AM-LCDs. The tariff presumably should have shifted some business over to the handful of U.S. AM-LCD makers, but so far, that has not happened.

"I can't say that computer companies are beating a path to our doors," said David Marvin, vice president sales and marketing at Optical Imaging Systems, Inc., which claims to be the only U.S. manufacturers of AM-LCDs.

The best hope for launching a U.S. display industry lies in a U.S. Air Force proposal to fund an LCD plant — cost of the project could be as much as $300 million — by committing to purchase screens, according to JTEC. The military needs the flat-panel displays for aircraft cockpits, command and control centers and several other systems.

EDITORIAL

Write stuff

As you've read in our blurb on the front page and in the further explanation on page 2, we're initiating some changes in *Computerworld* this week, including a revamped suite of sections.

What you need to know is that these changes are the first of a series of additions and improvements we are making on your behalf. And while I can't open the kimono entirely, I can tell you about some of the coming attractions.

For starters, this week you will find all our news pages contained in one contiguous news section, starting with the front page and running to page 24. This means no more jumping around to the back of the paper to find the rest of the news.

I can tell you unequivocally that there is no other paper or magazine out there that offers this convenience or that offers so large a news section (mainly because we have more than twice the number of staff of any other IS publication). We're spending a lot of money in the printing process to effect this section change without interrupting our usual delivery schedule. But you people said you wanted this kind of change, and you're certainly worth it — and more.

Starting early next month, we will be doubling the number of our Buyers' Scorecards. These unique product guides are the distillation of your peers' experiences with the hottest new products. And in a couple of months, we will unveil a one-of-a-kind set of product reviews and benchmarks that will give you the opportunity to get objective information on brand-new technologies in the marketplace. It's silly to think that any one test lab can offer this kind of information, and it can't. So we've found a better way to get this data to you. Stay tuned.

We are in the midst of installing the most advanced publication production system in the world. This million dollar project will give us an unprecedented ability to blend text and graphics into a new and exciting presentation, which we will unveil in a few months.

We're not just trying to look pretty or snazzy. Rather, we want to give you a paper that maximizes the precious time you have to read each week while allowing you to derive all the information you need from our pages. Our goal here is simply this: to deliver the most reader-friendly publication you'll find anywhere.

And there are a few other surprises I can't talk about right now.

So recession or not, we're investing money for you, not a lot of rhetoric and hot air. We're making these changes and additions by taking our cues from exhaustive research as well as from the comments of hundreds of readers. After all, you invest in us, both with your time and your subscription dollars. This is the least we can do — and the most.

Bill Laberis

Bill Laberis, *Editor in Chief*



LETTERS TO THE EDITOR

Tutti-frutti poetry

After reading the editorial titled, "Fruitcake" [CW, Dec. 16, 1991], I think I'll suggest that the company that I work for change its motto from 3P = projects + programming + production to 3P = projects + programming + poetry.

My best regards from the youngest country in the world.

Zvonko Kribel
Slovenia/Yugoslavia

A lifelong sentence

The Dec. 16, 1991 editorial cartoon and the "Arrows on target" letter [CW, Jan. 20] do not take into consideration where technology is headed and the eventual impact it will have on productivity. The computer technology of today is complicated and hard to use; that is true. So should we stop advancement of technology and train all the people to use these difficult tools?

To improve productivity with today's technology is to sentence the business world to a struggle to become instructors in an underdeveloped computer environment for a long time to come.

We are close to breaking through to "super user-friendly" technology. The speed at which we traverse through this barrier should be determined by the need to be there and the pain of traveling this distance.

Evolution of technology is the only way to get there, and business must keep up. It may cost more to get to a point of "computer ease," but the expense can be recouped by getting down to business when we do arrive at this threshold instead of conducting intensive training in complicated technology. Not only is this course "smart," it is reality.

Richard Potter
Madera, Calif.

Integrity tests work

Regarding "Workers under surveillance" [CW, Jan. 6], I feel compelled to respond to the author's cavalier dismissal of the value of integrity tests to employers.

The article states, "The Office of Technology Assessment (OTA) found that there is no evidence that integrity tests predict behavior on the job." In actuality, the OTA concluded that "The research on integrity tests has not yet produced data that clearly supports or dismisses the assertion that these tests can predict dishonest behavior."

This ambiguous conclusion is not surprising, given the fact that the OTA reviewed less than 5% of all validity studies. As a result, the OTA paper was criticized for its bias, inaccuracies and lack of scientific rigor.

A subsequent report by the American Psychological Association, which the scientific community considered more thorough and objective, found that "the preponderance of the evidence" supports the tests' "predictive validity . . . it is consistent with the idea that these tests reflect aspects of personal integrity and dependability."

In reality, professionals who are familiar with the facts view integrity tests as a noninvasive, nondiscriminatory and valid means of applicant testing.

David W. Arnold
Association of Personnel Test Publishers
Washington, D.C.

A CASE in point

"Client/Server CASE in '92" [CW, Jan. 13] is absolutely on the mark in asserting that 1992 will be the year of computer-aided software engineering (CASE) tools for cooperative processing applications.

But we were surprised to read that available CASE products offer "GUI tack-ons [that] simply add desktop style." In our department, we use CASE products that clearly exceed the limitations of the simple graphical user interface-builders described in the article.

In fact, at BC Gas, we recently completed a major client/server-based Work Management System. The $8 million system has transferred work routing and processing from the mainframe to workstations.

We used Foundation for Cooperative Processing, Andersen Consulting's client/server CASE tool set, to tackle many client/server development challenges. The product not only generated the design, windows and workstation code but also enabled us to partition the system so that 80% of the business logic now resides on workstations.

Tom Young
BC Gas, Inc.
Vancouver, British Columbia

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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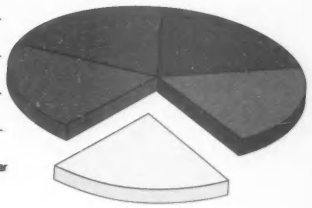
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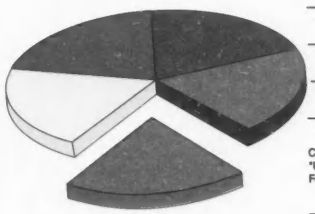
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Lying about information security

CHARLES CRESSON WOOD



Many people lie about the status of information security in their organizations.

While they know the truth is quite different, they rationalize their lies in a number of ways.

One of the most common rationales for denying security problems is the "principle of secure image," which holds that if an organization looks vulnerable, it invites attack and exploitation.

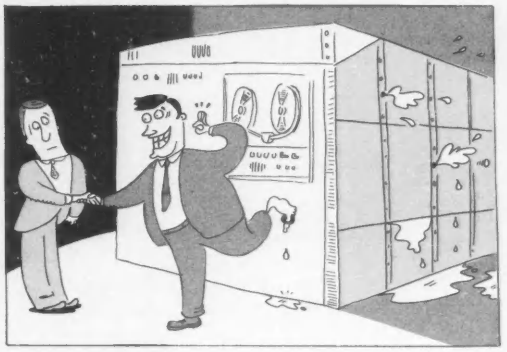
Operating on this principle, many organizations choose not to disclose that they have been victimized by a computer crime for fear that disclosure would invite additional attacks, loss of customer confidence, stockholder suits and investigations into the adequacy of supervision.

Before you say, "But of course," consider whether misrepresentation of information security status is appropriate.

Look at what happened to AT&T. Despite the fact that it spends more than $1 billion each year advertising that it is the most reliable supplier of long-distance services, it suffered four major outages in the last year and a half. The chairman of the board was forced to make a public apology. Rivals, such as MCI and U.S. Sprint, took advantage of the situation. As a result of the outages, the FCC initiated an investigation and is now proposing new legislation.

While the AT&T situation most likely was not a deliberate misrepresentation, it does highlight the fact that making statements about security that cannot be definitively substantiated is a very risky proposition.

But what if your organization does not advertise its information security status? Is it permissible to simply remain silent about a bad information security situation? Maybe not.



M.E. Cohen

A vice president of a computer security vendor recently told me how major commercial banks are misleading other banks that offer automated teller machine services by pretending that they encrypt personal identification numbers when they do not. These banks have developed software "workarounds" that allow the same telecommunications protocols to be used without encryption.

We all know the weakest link can bring a whole security system down. When a major fraud takes advantage of the vulnerability resulting from this misrepresentation, who will have to pay?

Leading people to believe that information security is adequate when it is not may be worse than admitting there is no security. Increasingly, management is responsible for information security and more likely to be held liable if concealment can be proved.

There is another principle that should take precedence over secure image, and that is the principle of low profile. Low profile stresses that the existence of significant assets and the nature of control measures should not be thrust into the public eye because to do so might invite or even assist attacks.

Applying this principle involves concealing the very existence of controls or certain aspects of control implementations. For example, many data processing departments do not tell end users exactly what activities will be logged.

Using the principle of low profile does not mean that accurate assessments of current vulnerabilities are not communicated; just that they are communicated only to those who can do something about them.

Communication a key

Even if one does not know the extent of a vulnerability, it is advisable to communicate. The legal notions of responsibility for information security losses are still evolving, and, in the future, a court may hold people responsible because they knew about a vulnerability but failed to inform those who could do something.

Further, what may appear immaterial today may be worthy of attention tomorrow. Computer viruses were not much of a concern five years ago, but they surely are today.

Overall, it is better to err on the side of truthful communication than on the side of looking good.

Wood is an independent information security consultant based in Sausalito, Calif. His latest book (published by Baseline Software) is *Information Security Policies Made Easy.*

What separates them from us? Talent in spin control

MICHAEL COHN



Bad stuff happens in IS. Tape drives explode. Projects end up late. And, every so often, a third-grader hits the halon release during a field trip to the computer room. But those things don't stop some folks from succeeding.

What's the difference between them and us? How do they get to be CIOs, while we're stuck grinding out code and mounting tapes?

It's simple, really. When bad things happen, they know how to handle themselves. They don't pull out their hair or kick in the side of an impact printer. They are cool. They are calm. And they know how to deliver bad news and still smell like roses.

Those skills can be learned. Here are some examples of wrong and right ways to handle bad situations. Read them closely, and maybe someday you too can have real office furniture.

• **Situation 1:** A vendor collapses with your money in hand.
You could say: "How am I going to explain this? I just paid them half a million bucks for software and support. And now I hear they're belly-up. All that money down the drain, not to mention the months it'll take to support the stuff in-house. The boss is going to kill me!"
What you should say: "Look at this invoice for half a million bucks. Do they think I was born yesterday? This is the last time I write a check to these clowns. From now on, we support this stuff in-house, no matter how long it takes or how much it costs. It'll be worth it, 'cause without my business, I bet these guys fold like a house of cards."

• **Situation 2:** Unexpected precipitation hits the data center.
You could say: "You're not going to believe what happened. We buy this $60,000 midrange system, then install it right under a pipe in the ceiling! And, of course, the pipe bursts and the CPU is totaled . . . along with the other one I installed five feet away as a backup. What was I thinking? Do you happen to know if we have any insurance?"
What you should say: "You are not going to believe what happened. I recently started Phase I of a comprehensive IS contingency audit. I conducted a flood control simulation and uncovered some surprising results: Our disaster recovery plan is inadequate. I think it is now appropriate to start Phase II — an analysis of our hardware liability and coverage provisions."

• **Situation 3:** You are snookered by a smooth sales pitch.
You could say: "Gosh, am I mad. I recently took delivery on 20 workstations and two weeks later the vendor announced a brand new model. It's half the size, twice the power and costs $3,000 less. I just threw a fortune out the window."
What you should say: "Gosh, am I mad. The vendor is discontinuing those reliable workstations we've used for years, so they can peddle a new, bleeding-edge model. Why can't they leave well enough alone? Fortunately, I was able to get my hands on 20 of the old ones, just in time."

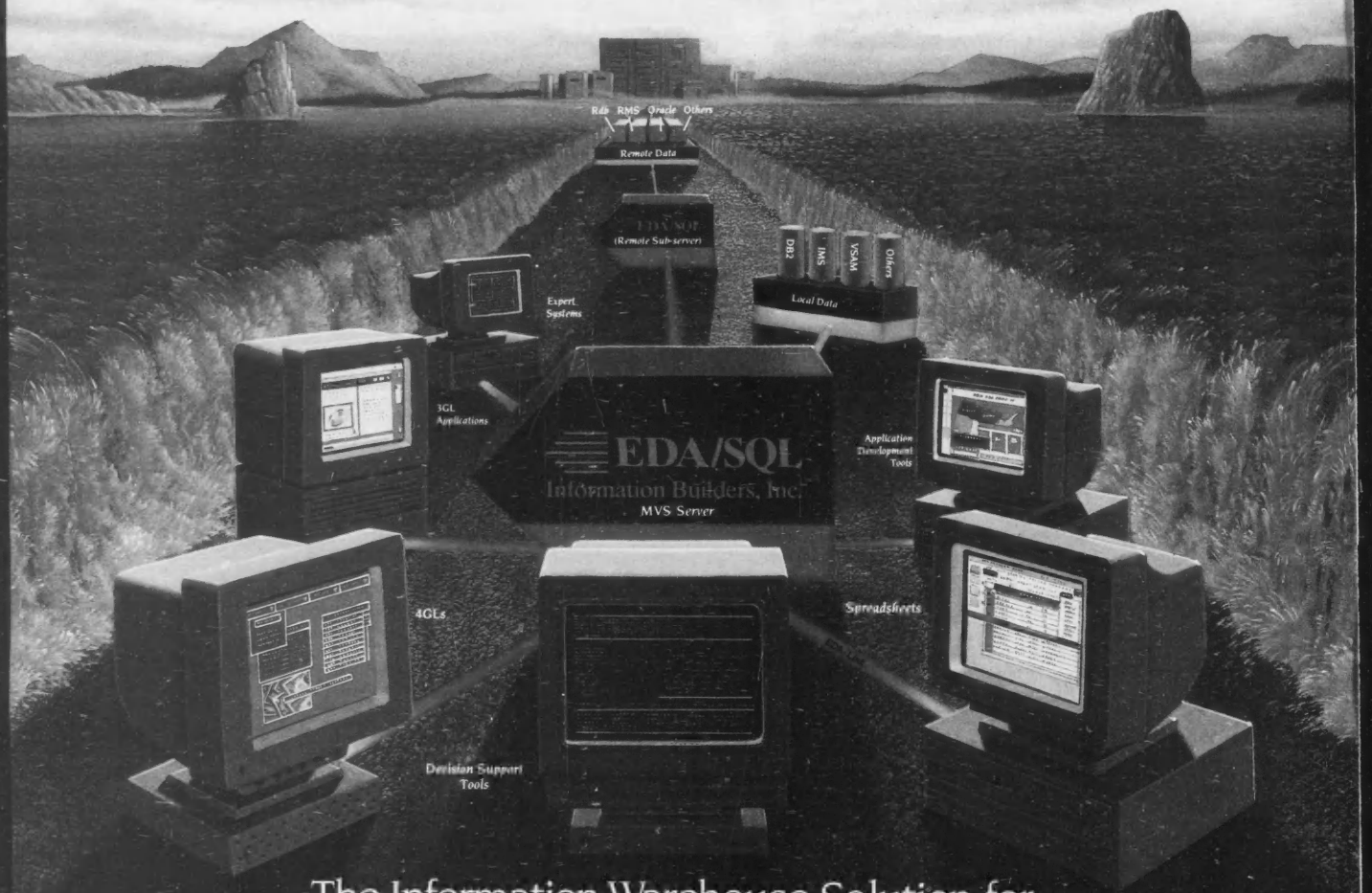
• **Situation 4:** There's a little accident with a sharp object.
You could say: "I just scratched a production tape. Not just any production tape, either . . . the paycheck production tape. I knew I should have made a backup. How the heck are we going to run payroll? Why does stuff like this always happen to me? You're not mad, are you?"
What you should say: "I just determined that if we outsource our payroll, we can save this company $10,000 a month. Let's start today."

• **Situation 5:** A presentation runs off course.
You could say: I know you asked me to invite the CEO to this customer demo and to make sure everything worked OK, but suddenly the system just went haywire. Now the CEO is mad . . . really mad. Somebody is going to get fired over this, probably the next guy from IS who walks into his office."
What you should say: "The CEO wants to see you now."

Cohn works for a very large computer company in Atlanta.

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BOARD WATCH

Chris Lindquist

Hacker heaven, user hell



The boards have been busy, and once again, one of the prime topics is "How to disrupt normal life on busy systems."

The publisher of *The Little Black Book of Computer Viruses* received some free publicity on Usenet recently when a user gave a quick review of the book, which contains source code for a wide variety of computer viruses. The book is purely "informational," of course. Just like those "Build your own pipe bomb with common household objects" ads in the back of mercenary magazines, I suppose.

.....

Also from Usenet: The "Digital Free Press," an electronic newletter, had its inaugural issue posted to the alt.hackers news group. Among the topics covered was how to do a number on (i.e. bring crashing down) some DOS systems, particularly bulletin boards, using a file *name* (I won't go into details here) and "intelligent" phone scanning. ("Hello, this is lineman X. I'm tracing the line noise problem you reported, but the number I was given was a voice number. What is the data number?")

Another note: The board the newsletter comes from contains a number of hacker files, including some assembly code purported to do damage to hardware with software. (Despite what Computer Science 101 professors say, it can be done.) For example, some do everything possible to make a hard drive try to read the spindle, not the platter.

.....

And from Usenet yet again (I'm seeing a trend here), a user has posted a password-cracking program that will find the under-18-character password of any encrypted Wordperfect 5.0 or 5.1 file. "I exploited a really stupid move on Wordperfect's part in the way it encrypts files," the user wrote. Certainly useful if you forget your password. Useful for other things, too, if you're of a mind.

.....

IBM's limited availability version of OS/2 2.0 is certainly

Continued on page 41

NBC builds network on Mac foundation

BY JIM NASH
CW STAFF

CHICAGO — There was no drumroll, no starlet tearing open an envelope, no gold statuette to collect. Nonetheless, NBC's first implementation effort following its decision to use Apple Computer, Inc.'s Macintosh as the foundation for its new information systems strategy has caused some excitement here.

The television network last week detailed plans to equip its Chicago affiliate, WMAQ, with at least 30 Macintosh LCs. The company expects to set up the equipment and train the staff by April 3. It is the first step in a long-range plan to update the network's six TV stations.

The Macintosh beat IBM's OS/2 and Microsoft Corp.'s Windows 3.0 in a competition last year [CW March 25, 1991].

Apple's ease of installation, operation and management overcame an ingrained prejudice at NBC against tinkering with the network's IBM OS/2-dominated systems formula.

NBC's decision came down to a choice between the Macintosh's ease of use and user-friendliness and OS/2's links to NBC's IBM-based communications infrastructure. Given that the computers were destined in

Continued on page 37



NBC's WMAQ Chicago

- **Challenge:** To empower employees with a desktop system that is easy to use and maintain.
- **Technology:** Apple Macintosh LC desktop machines attached via Token Ring and Novell Netware networks to Macintosh II SI and CI servers.
- **Goal:** To improve sales staff productivity by at least 10%.

IBM eyes calendar as OS/2 deadline nears

BY ROSEMARY HAMILTON
CW STAFF

IBM's new habit of frequently promising that its OS/2 Release 2.0 will most likely ship by the March 31 deadline may help clean up OS/2's dented image, but it may also put more pressure on IBM itself.

"We are roaring through the test program today," Tommy Steele, director of the Personal Systems Programming Laboratory in Boca Raton, Fla., said last week. "Our people are working hard, and they are looking forward to a spring vacation."

This posturing might help deflect some of the negative publicity that continues to dog this desktop operating system. At the same time, each promise raises the stakes even higher for IBM and sets IBM up for a tremendous setback should it miss the deadline by even a short amount of time.

As of last week, however, IBM said it will ship the last 2.0 beta component within the next few weeks. This piece provides the seamless integration with Microsoft Corp. Windows applications. Steele said this piece is in the hands of "several hundred" IBM internal users and will ship to a limited amount of beta-test sites in the second half of February.

In the lab

Steele provided other 2.0 updates during the company's second OS/2 progress report teleconference in less than a month. He said the 32-bit graphics engine, another piece that was not part of the Limited Availability code shipped in December, is running in the laboratory and is in the hands of a "few hundred" internal users.

IBM is planning to provide additional modifications to the Workplace Shell for general availability, Steele said.

Some customers familiar with either Version 1.3 or a Windows environment have disliked the Workplace Shell because it is too different.

An IBM spokesman said the firm will provide a choice for users, who can then gradually migrate to the 2.0 Workplace Shell. "For those more used to 1.3 or Windows 3.0, there's a tiny bit of a learning curve," he said.

According to Steele, IBM will also be providing free LAN Server beta-test code as part of its development kits for customers with the 6.177 code. The code will be available until March 13 and is targeted at developers. It will not be offered to users of the Limited Availability code.

Revised Micrografx image editor due

BY CAROL HILDEBRAND
CW STAFF

The first offspring of the buyout of Astral Development Corp. by Micrografx, Inc. is due out at the end of the month, when Picture Publisher 3.0 ships.

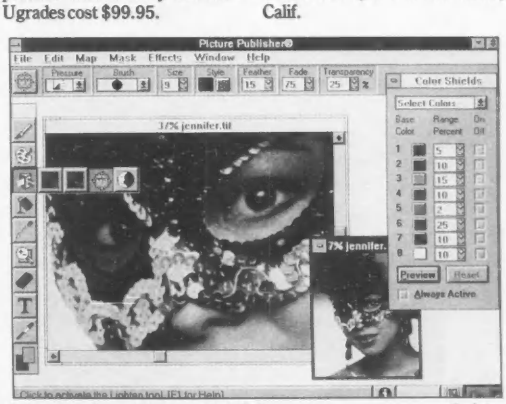
What will be hitting the shelves will constitute an almost complete rewrite of the old image editor, Micrografx product manager Grant Wickes said. Older iterations had a feature called an exchange window that forced users to switch to DOS to view a graphic, he said. "That wasn't acceptable. We had to rewrite to take advantage of Windows 3.1."

Image editors allow a user to take a scanned photograph and edit the resulting image to look like just about anything he wants. Picture Publisher's new features include enhanced masking tools that let a user define certain areas of the picture and protect either that area or the surrounding area from painting. Other features include added text and drawing tools, a color shield and added textures.

Don Jenner, a free-lance design consultant and beta-test user based in New York, said he considered the product light years ahead of its predecessor. He was particularly impressed by the intuitive way Picture Publisher handles changes in brightness, values and gray-scale tones, as well as the color shield. For instance, he said if he were working on a particular head shot of a person and had manipulated the flesh tones to his satisfaction, he could go ahead and put a color shield on them. "Then, you can go back and manipulate the rest of the picture without worrying about some global color manipulation changing the flesh tones," Jenner said.

With the Windows market more crowded with competitors — yet at the same time, smaller than that of the similar arena in the Apple Computer, Inc. Macintosh field — marketing schemes abound. Picture Publisher retails for $795, but Micrografx is bundling with the product a handheld color scanner worth $699, a practice that is fairly common. Ugrades cost $99.95.

However, some analysts questioned whether the move tends to erode the products' ability to sell on their own. "It looks like a lot of decent packages from a bunch of companies. The question is, 'Will they make any money on their own?' " asked Bill Coggshall, president of New Media Research, Inc. in Los Altos, Calif.



Micrografx's Picture Publisher *lets users protect finished areas with a color shield while they edit and color other areas*

Premium Exec 25-MHz 386SX: Fast but pricey

Technology Analysis — A roundup of expert opinions about new products. Summaries written by freelance writer Emily Leinfuss.

AST Research, Inc.'s latest notebook, the Premium Exec 386SX, offers superior overall performance by incorporating Advanced Micro Devices, Inc.'s AM386SXL 25-MHz microprocessor.

Performance: The notebook scored 20% faster than the firm's 20-MHz model in benchmark tests.

Ease of use: Reviewers said the machine's keyboard has a solid feel, and its controls and ports are conveniently located. Because it has no handle and is somewhat thick, bulky and heavy, portability is a concern.

Power supply: The battery longevity for the AST Premium Exec is average — about 2½ to three hours. While the product offers battery-saving features, they are not helpful to users of graphical environments such as Microsoft Corp.'s Windows, according to *PC Week* lab tests.

Design: Though the notebook does not use an Intel Corp. microprocessor, tests found no compatibility problems.

Value: The AST Premium Exec is a sound product. It offers twice as much random-access memory and more disk storage than its competition for $4,795.

AST Premium Exec 386SX/25

Reviews	Performance	Ease of use	Power supply	Design	Value	Overall
PC Week 9/2/91	Quick, packs a lot of punch	Solid keyboard, crisp screen	Little or no power savings for GUIs	Large standard memory and capacity	Priced lower than competitors	Attractive name-brand alternative
PC Magazine 10/29/91	Fastest 386SX notebook	Dedicated ports included	Better battery life	Similar to 7-pound 386SX/20	Price nearly twice that of 386SX/20	Competitive machine
Computer Buyer's Guide 1/92	Extraordinary horsepower	Typical keyboard	Good	No compatibility problems	A lot of equipment for the price	Like having a full-size computer
Users						
Len Tillman, McGinky & Tillman CPA	■■	■▄	▌	■▄	■▄	Fairly pleased
Todd Snedeker, NIS, Inc.	■■	■■	■▄	■■	■■	100% multipurpose
Analysts						
George Thompson, Datapro Research Corp.	■■	■▄	■▄	■▄	■■	Priced to sell
Mike Kelly, Techtel Corp.	■▄	■▄	▌	■▄	■▄	Hit market hard, then fell back
Cheryl Currid, Currid & Co.	■▄	■▄	NC	■▄	▌	OK but heavy
Andy Seybold, Dataquest, Inc.	■▄	■■	■■	■■	■■	Value leader

Key: ■■ Very good ■▄ Good ▌ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

AST Research, based in Irvine, Calif., reported net earnings of $16.7 million on revenue of $239.1 million — a 48% increase — for the second quarter of 1992, ending in December 1991. Financial analyst Rick Martin at Prudential Securities, Inc. rated AST's long-term stability as very good and its short-term performance as very good.

AST Research responds

Bret Berg, product manager, portable system marketing:

Ease of use: Future products will include a handle and be less bulky and heavy.

Power supply: The machine could not suspend in Windows protected mode, which is true for any 386SX-based notebook. We now ship a power management driver that allows for full suspension.

Acer Anywhere 1120NX: Solid but slow

Acer Anywhere 1120NX

Reviews	Performance	Ease of use	Power supply	Design	Value	Overall
Byte 9/91	Comfortable	Great screen, ergonomic keyboard	Good features	Ergonomic, sensible	A real value, stands out from the pack	Shining example of next generation
Infoworld 11/18/91	Satisfactory	Very good	Good	Very good	Satisfactory	6.3*
PC Computing 11/91	Good	Great looks and display	Disappointing	Excellent parts and options	Good	A lot that's neat; a couple of cons
PC World 2/92	Unimpressive	Crisp display, odd keyboard	Short battery life	Heavy, slow	Good	Good choice for presentations
Users						
Bruce Davidson, Information, Inc.	■■	■■	■■	■■	■■	Love it, minor cable problems
Linda Harrison, Systems Design, Inc.	■■	■■	▌	■■	■■	Goes everywhere
Ron Hunt, Oxford Energy Corp.	■■	■▄	■■	■■	■■	Great machine
Analysts						
Andy Seybold, Dataquest, Inc.	■▄	■▄	■▄	■▄	■■	Good, solid product for the price
Cheryl Currid, Currid & Co.	■▄	■▄	NC	▌	■▄	OK

Key: ■■ Very good ■▄ Good ▌ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* rating based on 1-to-10 scale.

Vendor background information

Acer America, based in San Jose, Calif., reported net earnings of $2.7 million on revenue of $949.5 million for fiscal year 1990 (1991 figures are currently unavailable). Financial analyst Rick Martin at Prudential Securities, Inc. rated Acer's long-term stability as very good and its short-term performance as very good. The company employs 5,711 people.

Acer America responds

Olend King, director of product marketing:

Power supply: Most batteries run about 2½ hours. We feel the battery life [of the Acer Anywhere 1120NX] is adequate, given the technology that is used and the associated price.

Design: The size and weight fit design goals at the time. There are lighter notebooks, but they have a tendency to compromise on features.

Except for a few important extras, Acer America Corp.'s Acer Anywhere 1120NX notebook stands squarely in the middle of or below the competition in key categories, reviewers said.

Performance: The Anywhere is not a speed demon: *Infoworld* marked it as the third, second and first slowest in multitasking, disk speed and CPU speed, respectively.

Ease of use: Ergonomic features, such as a rear handle that tilts for optimum viewing angles and an impressive triple supertwist screen, make the Acer simple and agreeable to use.

Power supply: Even with internal battery packs and three power-saving modes — doze, sleep and suspend — battery life for the Acer is unremarkable. Tests range from a little more than two hours to close to three hours.

Design: Weighing 7½ pounds and measuring 11- by 8½- by 2-in., the Acer Anywhere 1120NX does not come in an earth-shattering size or weight, but it was noted as being solid, with a very good system design.

Value: While the Acer is not the least expensive ($2,995), reviewers said the machine's extras, such as a 9.6K bit/sec. fax/data modem, a 60M-byte hard drive (with the $3,795 model) and Lotus Development Corp.'s Agenda, make the machine a very good value.

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NBC builds net on Mac foundation

CONTINUED FROM PAGE 35

large part for affiliates far-flung from the mother station and bereft of internal technical staff, the Macintosh's ease of use won out over OS/2.

"Even though the idea of moving into the Mac environment was an unpopular corporate position, the real corporate goal was to empower employees, not to create additional hierarchies" of IS management at stations, said Joe Harris, director of information technology at NBC's TV station division in New York.

The Macintoshes will go to 21 sales staff members and nine other employees who deal regularly with that department. NBC also purchased an undisclosed number of Macintosh IISIs and CIs to be used as servers.

The station will not work entirely without a safety net, however. Lisa Churchville, sales director at the station, said two people from Harris' information technology department will be permanently stationed at WMAQ.

Harris, Churchville and Sam Lawson, a consultant working on the project for NBC, all said they believe that the Macintosh network and the "builder" concept will prove successful.

"I feel very comfortable with our having to support ourselves," Churchville said. "I mean, we're not setting up major models for forecasting. This is fairly simple algebraic-type work we are doing." Spreadsheet analysis software will be one priority, she said.

Though company executives are not calling the Chicago installation a pilot, they say they expect other departments and stations to view the all-Macintosh setup as a model for future systems.

Were that to happen, NBC — owned by cost-conscious General Electric Co. — could reap long-term savings in several areas.

Use of similar nests of Macintoshes to replace more heavily used and support-intensive IBM Application System/400s and 3090 terminal emulation systems as well as Digital Equipment Corp. VAXs could actually cut support costs for the TV stations, Lawson said.

At the same time, the sales representatives — many of whom are "keyboard illiterate" — could see productivity increases from the new systems, according to Churchville's estimates. "We've already started some training," she said. "The [staff's] enthusiasm is high." She predicted that "on-site productivity will rise in 60 days . . . probably by 10%." That figure could rise if the currently minimal computer intercommunication with external agencies is increased via electronic data interface-type transactions.

For the most part, the Macintoshes will replace the underused dumb terminals that are currently used to reach mainframe databases. Software for 3270 terminal emulation will reside on the network, Harris said, providing access to mainframe databases.

Harris had to show his superiors that adopting Macintoshes would not limit communications and interoperation with the network's extensive IBM installed base, which includes some personal computers on existing Novell, Inc. Token Ring networks.

Demo 92: From the practical to the playful

BY CHRISTOPHER LINDQUIST
CW STAFF

PALM SPRINGS, Calif. — Sneak previews, product shoot-outs and announcements abounded at Demo '92, with products ranging from toys looking for practical applications to practical applications as fun to use as toys.

On the lighter side, **Horizon Entertainment** demonstrated the Virtuality Virtual Reality System. Users donned helmets containing LCD screens that placed them in a world populated with pillars, a killer teradactyl — and each other.

Logitech, Inc. demonstrated its 2-D/6-D Mouse and Headtracker, allowing users to look under three-dimensional cars and work with a virtual "lathe."

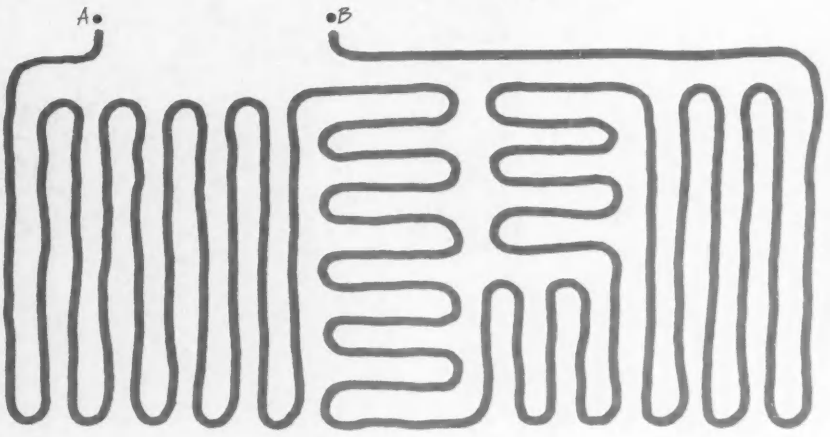
Slate Corp.'s At-Hand also attracted attention. Visicalc creator Dan Bricklin's latest foray into the spreadsheet market is based on Go Corp.'s Penpoint operating system and uses gestures, or pen "shorthand" equivalents to keyboard shortcuts.

Operating environment integration was on people's minds. **Microsoft Corp.** demonstrated the unreleased Windows 3.1 running DOS applications, while its rivals showed they could run Windows, too. **Sun Microsystems, Inc.** demonstrated an Intel Corp. I486-based processor board that ran Windows. **The Santa Cruz Operation** showed Windows and DOS sessions multitasking under SCO Open Desktop Version 2.0. And IBM ran Windows under OS/2 Version 2.0.

Meanwhile, **Quorum Software Systems, Inc.** took attendees on a test drive of its Quorum Compatibility Engine. This is a tool set that helps Apple Computer, Inc. Macintosh developers port their applications to Unix-based systems.

Of course, some demonstrations did not come up to snuff — one of the side effects of previewing beta software. One slipup was **Apple**'s voice recognition system, which decided to stop listening.

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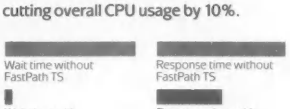


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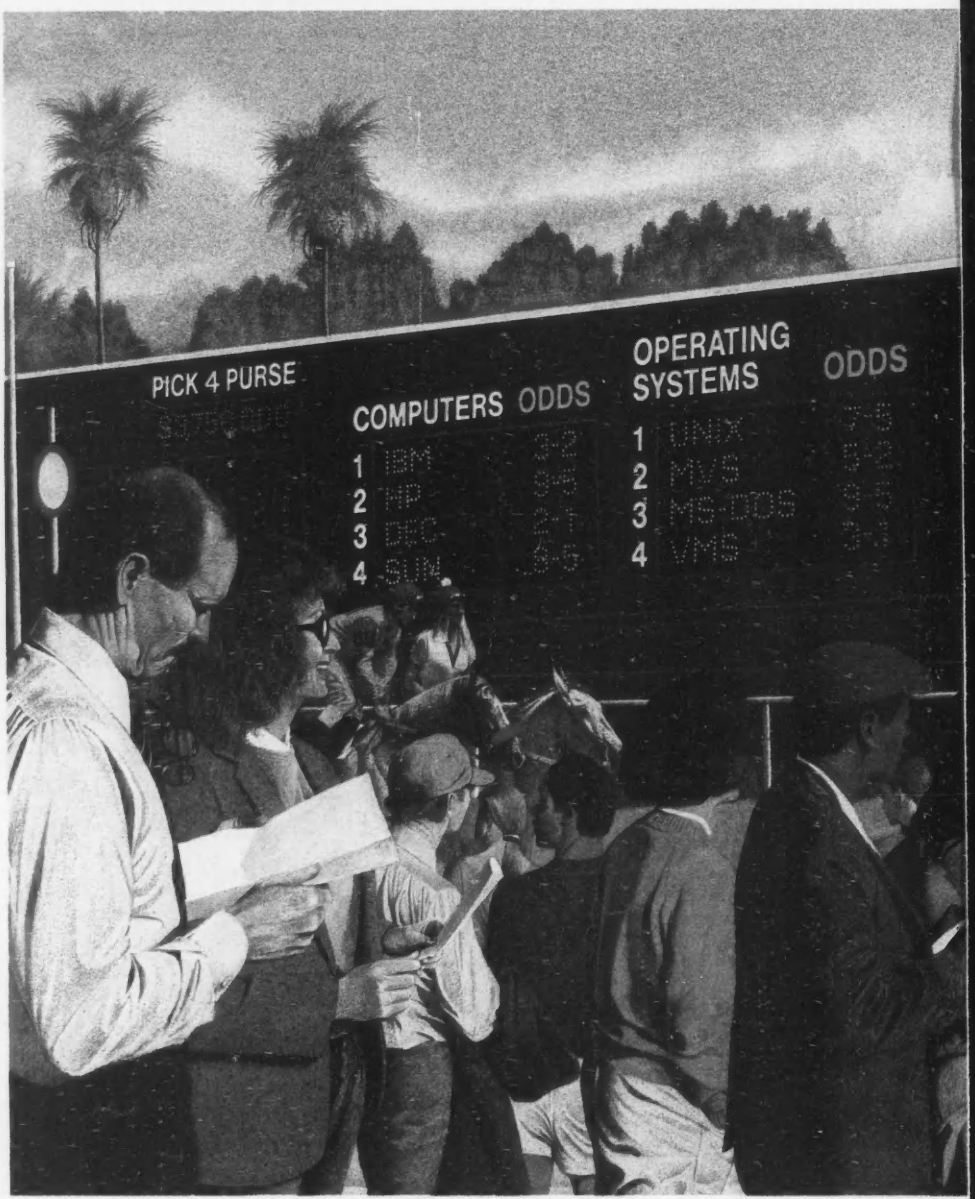
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Mac applications find home in Unix

BY MARYFRAN JOHNSON
CW STAFF

MENLO PARK, Calif. — Quorum Software Systems, Inc. sent a ripple of interest through the software industry recently when it unveiled a new technology enabling Apple Computer, Inc. Macintosh applications to run native on a variety of high-speed Unix workstations.

Software developers will get first crack at Quorum's product by midyear, although users must wait until next fall or winter before shrink-wrapped Macintosh applications are running on their Unix machines.

Quorum's new technology was arguably the most intriguing one on display at the Uniforum Unix trade show last month in San Francisco. "Everyone was sort of oohing and aahing over it," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass.

The notion that one jazzy piece of software can translate an application from one platform to another — without tedious rewriting and recoding — is usually dismissed as a pipe dream, Hurwitz added. "In reality, there are ways to do it, and Quorum is piquing people's interest. This is a new twist on portability," she said.

How does Quorum do it?

Secret to success

The answer hinges on a core piece of software Quorum calls its "compatibility engine," which is the base for two products: Latitude (for software developers) and Equal (for end users).

Latitude Version 1, currently in beta testing with shipping planned for midyear, allows software developers to recompile Macintosh programs written in a high-level language, such as ANSI C, into a native Unix executable program.

"Basically, this converts the [Macintosh] code and automatically maps the toolbox and [builds APIs] to the specific Unix processors," said Rikki Kirzner, an analyst at Dataquest, Inc. in San Jose, Calif. "It's a very slick product."

The end-user product, Equal, will let users run off-the-shelf Macintosh applications directly on reduced instruction set computing (RISC)-based workstations at speeds up to four times faster than conventional emulation. It is scheduled to ship at the end of this year.

One part of the Quorum engine is a portable implementation of the Macintosh application programming interface (API), developed using ANSI C and standard Postscript interfaces. The other part is a set of libraries that maps the Macintosh's graphical user interface (GUI) into the GUI on the target platform.

Since the Macintosh applications appear in the existing windowing system on the workstation, they gain a more sophisticated look and feel, Kirzner said. "Apple hasn't begun yet to port its tool kits to RISC, so Quorum has a leg up there," she said. "But they did it cleanly, so they're above reproach and above lawsuit."

Quorum used Apple's published specifications in designing the compatibility engine, as well as licensing one key piece of code from Apple. An Apple spokesman said the company is evaluating the Quorum products and had no comment yet.

Initially, the products will be available on Unix workstations from Sun Microsystems, Inc., IBM and Silicon Graphics, Inc. Software vendors declaring support for the products include Spyglass, Inc., Aldus Corp., Quark, Inc. and Cambridge Scientific Computing, Inc.

"From our point of view, Quorum has changed the rules by providing technology that makes Unix an extension of the Macintosh development environment," said Stewart Rubenstein, president of Cambridge Scientific Computing.

Windows tool for novices

Programmers who need to write in C for the Microsoft Corp. Windows environment often find themselves facing a steep uphill climb to learn all the ins and outs of developing for the interface. Intelligenceware, Inc., a Los Angeles-based software vendor, has released a product it claims will get developers over the curve much more quickly, however.

Windowsteach is an interactive Windows programming tutor that reportedly guides C programmers through the use of graphic tutorials, hypertext and source-code annotations. It can be used with both Microsoft and Borland International, Inc. C development languages.

"I learned by myself," said John Chang, a senior programmer at United Airlines in San Francisco. "I don't need somebody to teach me because it's kind of a self-study."

Windowsteach can teach about such topics as event-driven programming, icons and device-independent graphics. It also includes a "hints and suggestions" section to help programmers avoid common Windows development mistakes.

The product is available now at a list price of $123.

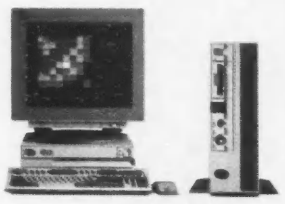
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Lindquist

CONTINUED FROM PAGE 35

attracting some attention on Compuserve, the vast majority of it positive. Users are commenting on the speed, robustness and reliability of the multithreaded, preemptive multitasking operating system — a better DOS than DOS, a better OS/2 than OS/2.

If seamless Windows comes through, along with some good marketing (always a big if with IBM's software side), OS/2 may still have a chance. Plenty of bulletin board system users are still asking the Windows vs. OS/2 question, even in the Relaynet MS-DOS and Windows groups. And if the tone of some of the "conversations" is any indication, there could be some wars brewing internally at some firms as they make the OS/2 2.0 vs. Windows 3.1 decision.

.....

More bad news for Central Point Software. Several people have been commenting on Relaynet about reliability problems with Central Point Commute. It seems the quality control problems are running pretty deep at the Beaverton, Ore., software vendor. A sad fall for a company that had one of the better reputations in the industry until recently. Changes, specifically with quality control, are being made to resolve the problems, according to the company.

.....

Here's a quote that started some discussion on a local board: "Mainframes are dinosaurs waiting for a meteor." It sure brought the mainframe programmers out of the woodwork in a hurry.

.....

Another tip, perhaps more aesthetic than practical: If you don't want to be forced to see that Microsoft Windows start-up screen every time you load the interface, type "WIN :". Reports are that it works with Windows 3.1, too.

.....

Not everyone was looking forward to the New Year; indeed, some PCs in AT&T's 6300 line refused to admit that it even exists. Board reports from several users indicated that some AT&T PCs reset to 1985 when the New Year rang in. It appears that the clock/calendar chip in the systems was only useful over an eight-year range, from Jan. 1, 1984 to Dec. 31, 1991. One user supplied a fix that moves the range to Dec. 31, 1995, but you have to want to do some hex editing of IBMBIO.COM — a slow process if you have a lot of these machines.

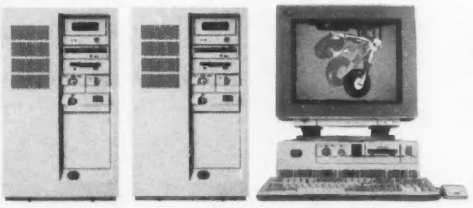
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Ever wonder why machines sometimes do things for no reason? Maybe there is a reason. A Usenet user described how his division guaranteed itself access to a database that had to be shared with a London branch: a resident program that rebooted the London-based machine every day at 5 p.m. Hardly good end-user relations.

Lindquist is a *Computerworld* staff writer.

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NEW PRODUCTS

Software applications packages

Caere Corp. has announced Anypage, a software technology that improves the ability of its Omnipage Professional optical character recognition software to read poor-quality documents.

Anypage automatically adjusts scanning brightness to allow for shaded, stained or lightly printed regions on a page, improving optical character recognition accuracy. Initially, the Anypage technology will support Microtek Scanmaker color and gray-scale scanners. Support for other scanners is also planned.

Omnipage Professional 2.0, including Anypage, costs $995. It is available for personal computers and the Apple Computer, Inc. Macintosh. Current owners of Omnipage Professional 2.0 and a Scanmaker scanner can receive an Anypage upgrade free of charge.

Caere
100 Cooper Court
Los Gatos, Calif. 95030
(408) 395-7000

Microsoft Corp. has announced Version 3.0 of Microsoft Project for Windows.

A customizable tool bar with print, print preview, outlining, spell checker and other functions has been added to the new version. The project management software package also features Planning Wizards interactive Help modules as well as customizable menus, tables and charts.

The product costs $695. Upgrades from previous versions are priced at $149.

Microsoft
1 Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

Peripherals

Toshiba America CP, Inc. has announced the immediate availability of a 17-in. flat-screen color monitor.

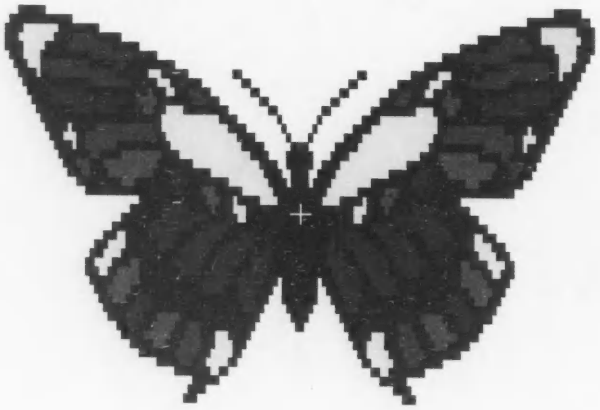
The P17CU01 display features 0.31mm dot pitch and 1,024- by 768-pixel resolution. The flat-screen technology offers improved accuracy in the display corners, the company said.

The unit is priced at $1,700.

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IN BRIEF

Accounting tool on way

■ **Microsoft Corp.** and **Advanced Business Microsystems, Inc.** (ABM) have announced an agreement to deliver a Windows-based accounting system integrated with Microsoft SQL Server Version 4.2. ABM also announced Sequel to Platinum, an integrated financial management program based on SQL Server 4.2. It is scheduled to be demonstrated at Networld in Boston this week.

■ **Micom Communications Corp.** and **World Communications, Inc.** have announced an OEM agreement through which Micom will supply World with Marathon data/voice network servers valued at $750,000. The servers will be used to support World's international voice and data services.

■ The Autoloader 5000 tape drive, tape loader and software system from Naperville, Ill.-based **Palindrome Corp.** is now shipping, the company said. It provides an online, automated backup of 50G bytes on Novell, Inc. Netware networks.

Firms race to fill high-end 3-D niche

BY MARYFRAN JOHNSON
CW STAFF

While price competition continues to sizzle in the low end of the Unix workstation market these days, another hot spot is developing higher up in the food chain.

Every major workstation vendor is racing to improve or expand its offerings in high-end, sophisticated three-dimensional graphics for markets such as animation, video processing, medical imaging, scientific visualization and engineering design.

Once the province of $100,000-plus specialized systems, the kind of capabilities found on high-end graphics systems are rapidly scaling down into a new price band from $15,000 to $50,000.

The longtime leader in 3-D graphics workstations — Silicon Graphics, Inc. — recently introduced its Crimson line of workstations with a full lineup of graphics options starting at less than $30,000.

"We're seeing record-setting graphics performance at prices no one thought possible even a year ago," said Thomas Greaves, a vice president at Daratech, Inc. in Cambridge, Mass. "To be seen as a credible workstation vendor, it helps to have systems that span a broad range of performance, and high-end graphics is a part of that."

In the past two months, Digital Equipment Corp. introduced a new lineup of multimedia-enabled Decstation 5000s, Hewlett-Packard Co. and IBM both rolled out new graphics options for their workstation lines, and Intergraph Corp. unveiled

Continued on page 53



Silicon Graphics' Crimson *line of 3-D workstations starts at less than $30,000*

IBM client/server line to come this year

BY JOANIE M. WEXLER
CW STAFF

WASHINGTON, D.C. — IBM intends to complete and ship its client/server product line this year for workgroups, mainframes and internetworks, according to Robert Roth, IBM's program manager for enterprise LAN communications.

Roth told *Computerworld* at the recent Communication Networks Conference and Exposition '92 here that IBM intends to focus on the organizational issues of transitioning data center personnel to be able to "offer their services to the workgroup." He said the goal is to prevent companies from having to ask the workgroup manager to "put himself under the thumb of the MIS manager" with client/server products such as software distribution programs.

On that theme, Roth cited continued heavy work with business partner Novell, Inc. as "servers move into the domain of the information technology manager." He said that step three of Netview support for Netware servers will be marketed by both companies in 1992.

That third product will allow the remote management of Netware servers under Netview via a bidirectional link. He said the product will allow users to act on information they are able to collect with the current version of Netware for Systems Application Architecture, such as file-server corruptions, server volumes getting full and unauthorized users trying to log on to the network.

Roth also revealed some plans for the Communications Manager component of OS/2 2.0, scheduled to ship in March. He said the firm's goal is to make the communications software competitive with LAN protocols in terms of performance.

Other enhancements to Communications Manager, he said, will include a transformation of the software "from a desktop product to a workgroup communications engine." He said this will include "split stack" support so that "on a user desktop, all you're running is an interface to the communications product; the bulk of the processing will be done on the server itself."

Imaging may increase productivity by 50%

BY JIM NASH
CW STAFF

Like a commuter grabbing the handhold of a train leaving the station, image technology is feeling the pull of sudden acceleration as it ties into networking.

By putting image applications on networks, companies can see a maximum 50% gain in productivity as measured by transactions per second, according to Roberta Wiggins, a senior analyst at The Yankee Group, a Boston market research firm. The combination, Wiggins said, can reduce staff needs by a third and can increase open floor space 40% to 80%.

A study she recently completed indicates that image technology — the process of digitally storing paper documents in massive databases — is poised in the next three years to triple its 1990 annual sales of $600 million. The upsurge is being attributed to increased network support of imaging applications.

For example, based on available technology, the Institute of Medicine, an association of health-related groups in Washington, D.C., has recommended that patient records be entirely computerized by the turn of the century. While that is ambitious, said Eunice Little, director of the medical record department at San Jose Medical Center in San Jose, Calif., imaging on networks will make that goal a possibility in the foreseeable future.

On a roll

Sales related to image processing are expected to continue their steady growth, with the biggest jump coming three years from now



Source: The Yankee Group

Wiggins predicts sales of $2 billion in 1995. "Imaging has been slow to take off partly because of costs," she explained, and partly because its value was limited by image's availability on stand-alone systems.

Little's experience tracks closely with Wiggins' research. The medical center originally examined a mainframe-based image system but rejected it because it was proprietary and slow. Networks such as the Banyan Systems, Inc. Vines product at the hospital are more open and faster, she said.

It was the confluence of networking acceptance and imaging around 1990, Little said, that has made imaging viable. She is one-third of the way through an anticipated 18-month schedule to bring a fully functional networked imaging system on-line.

Thirty percent of the center's images are digitized now. Little declined to predict when they might reach 100%, saying standards are needed before such a goal is attainable. She said, however, that the system as it stands today has cut her staff by 10%.

Kelly Services, Inc. in Troy, Mich., also sees imaging growing, but less for its ties to networking than its productivity-enhancing abilities, said Walt Bellono, senior director of information processing. His system is small — about six personal computers — but it handles 20,000 time cards each day. There are plans to expand the system, Bellono said, to handle paychecks for temporary employees.

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HEWLETT PACKARD

SNA competitors to manage LANs

BY GARY H. ANTHES
and ELISABETH HORWITT
CW STAFF

Two competitors in the IBM Systems Network Architecture (SNA) management world, Legent Corp. and Systems Center, Inc., recently entered the local-area network management arena within a week of each other.

Both entries target users who want to integrate LAN management with management of their host-based SNA networks.

Last week, Legent, based in Vienna, Va., announced the general availability of Lanspy, a software tool for reporting Token Ring LAN performance to IBM mainframes.

Lanspy monitors LAN errors, file server and gateway use statistics and, in conjunction with the mainframe-based Netspy, response times for networked personal computers accessing hosts over SNA, the vendor said. The results are forwarded to Legent's enterprise network performance manager, Netspy, for centralized LAN performance management and for integration with SNA statistics.

Lanspy is a "software probe" that looks at all data packets and builds performance statistics that are shipped periodically to Netspy for on-line user access or batch reporting. In addition, the product reports errors immediately and flags conditions, such as response times, that exceed user-specified thresholds. It also provides useful byproducts, such as lists of all users on the LAN, Legent said.

The tool reports both server I/O rates and the average time it takes a server to turn around requests, said beta-test user Tor Stenwall, a capacity planner at Boston-based New England Mutual Life Insurance Co. That function enabled the company to discover that a problem it had thought was an overloaded server was actually an application design flaw, one that caused the server to take up to one minute to execute a single database request.

Lanspy runs on DOS and monitors DOS, OS/2 and Unix workstations, as well as Token Ring LANs.

"Lanspy is unique, as far as I know," Stenwall said. "It was the only product that could communicate over SNA sessions to a mainframe host and then allow the data to be viewed from any 3270 session on a PC." The firm has 15 Token Rings and about 1,500 PCs, most of which are fitted for 3270 emulation, he said.

However, Systems Center's product, Solve:LAN, boasts remarkably similar characteristics. Announced late last month, the OS/2-based product is said to monitor LAN adapters and connections for both IBM's LAN Server and Microsoft Corp.'s LAN Manager. The product is also said to monitor LAN-to-host connectivity provided by either IBM's Communications Server or Microsoft's Communications Manager.

The product can act as a local LAN management workstation or pass alerts and recommended actions up to Systems Center's host-based SNA management platform, Net/Master, the vendor said. An event log displays network events by time interval and adapter.

Due out second quarter, Solve:LAN runs on either IBM or Microsoft OS/2 servers and is priced at $3,500 per LAN.

The initial release of Lanspy, shipping now, will work in Token Ring LANs gatewayed directly to IBM mainframes or tied indirectly via a bridge or router. Future releases of the product will support Ethernet, Transmission Control Protocol/Internet Protocol and Digital Equipment Corp.'s Decnet, Legent said.

Lanspy prices vary, depending on the number of LAN stations and the size of the IBM host. For 1,000 stations, the price is $30,000 for the network component. A group 40 IBM mainframe costs an additional $6,300.

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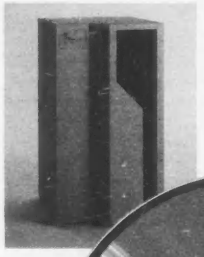
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Citrix to release Multiuser 2.0

Citrix Systems, Inc. in Coral Springs, Fla., is scheduled to introduce today a new release of its Multiuser operating system, a multiuser version of IBM's OS/2.

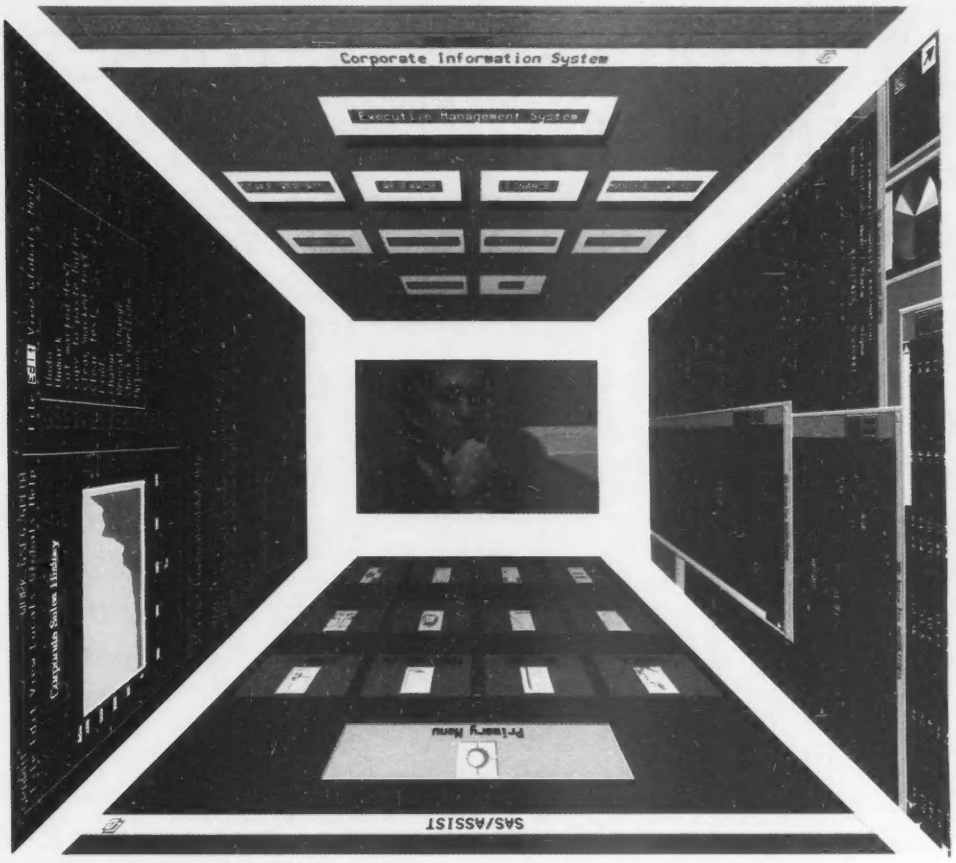
Multiuser 2.0, scheduled for shipment next month, is a 32-bit environment that can support Microsoft Corp.'s MS-DOS, Windows and OS/2 applications concurrently, according to Edward Iacobucci, Citrix's chairman.

Citrix has targeted its operating system at value-added resellers, but it is running a small direct sales effort as well.

The software was designed to compete against Unix systems rather than OS/2, Iacobucci said. The company is positioning it as a stand-alone system for multiple users or as a network-based server. Multiuser 2.0 is compatible with Novell, Inc.'s Netware, Microsoft Corp.'s LAN Manager, IBM's LAN Server and Banyan Systems, Inc.'s Vines.

Designed to function as a host platform, Multiuser includes terminal support, security and administration utilities.

Scheduled for a March release, the software carries a fee of $995 for a five-user license.



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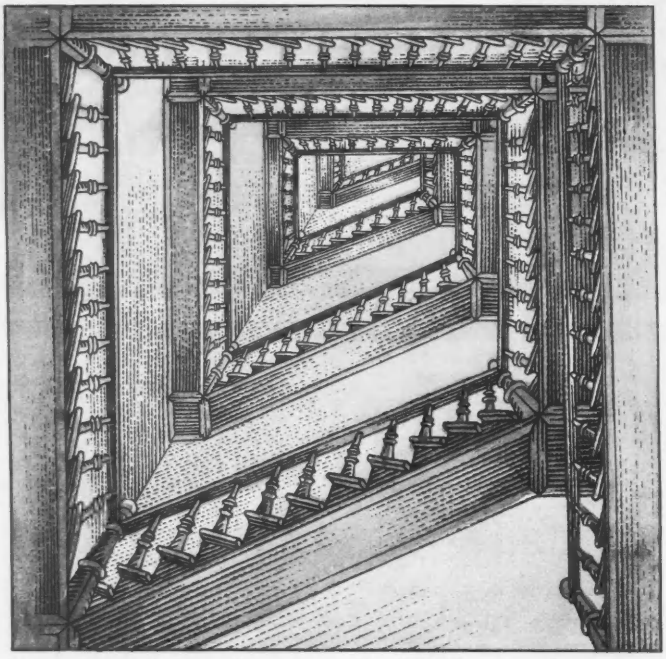
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When it comes to enterprisewide connectivity, not all e-mail systems work quite the same way.

While a lot of LAN-based electronic messaging systems provide connectivity across a variety of computing platforms, many don't do a very good job of it. The fact is that connectivity with poor performance is like not having any connectivity at all.



Electronic mail is quickly becoming a mission-critical component of day-to-day operations for many businesses. Despite this, research indicates that about 90% of all Fortune 1000 corporations can't communicate across their disconnected e-mail systems†.

This underscores how difficult it is to achieve quality connectivity in today's corporate environment. The reality is that LAN-based e-mail systems must be able to work in a robust fashion with an organization's existing LAN, minicomputer and mainframe systems.

What makes things even more complex is that technology is still in transition, so any connectivity decision you make today must also include an assessment of the future and how you plan to get your company there. Which means the pressure to architect an optimal long-term solution is extremely high.

If you're responsible for implementing and managing LAN-based systems, you should look beyond simple "checklist" connectivity and ask some very difficult questions. Questions like will the gateway enable you to leverage a messaging backbone to connect all of your dispersed LANs? Will the gateway support encapsulation to preserve rich data integrity? How tightly will the gateway be integrated with the e-mail system for directory synchronization and adminis-

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tration? How easily can users address messages to recipients on foreign e-mail systems?

Quality of connectivity is the critical factor. Simply sending interpersonal messages through a maze of gateways is only a minimum requirement. Too often, gateways can limit the overall functionality of the e-mail system, when in practice they should be expanding it. E-mail has evolved into a complex system of post offices, MTAs and gateways that must all cooperate as one entity. And relying on multiple electronic mail vendors just adds to the complexity. Which is why the selection of a vendor supplying connectivity technology is as important as the technology itself.



A single-source vendor can provide technical support and accountability for your entire LAN-based e-mail system. And products which are designed and developed together will deliver higher quality connectivity.

Another point to keep in mind is that a single-source vendor is much more likely to make timely technological enhancements to gateways that parallel improvements made in their e-mail system. For example, if your e-mail system evolves to allow users to embed charts in their messages, your gateways should evolve so that messages can be sent without losing formatting or data.

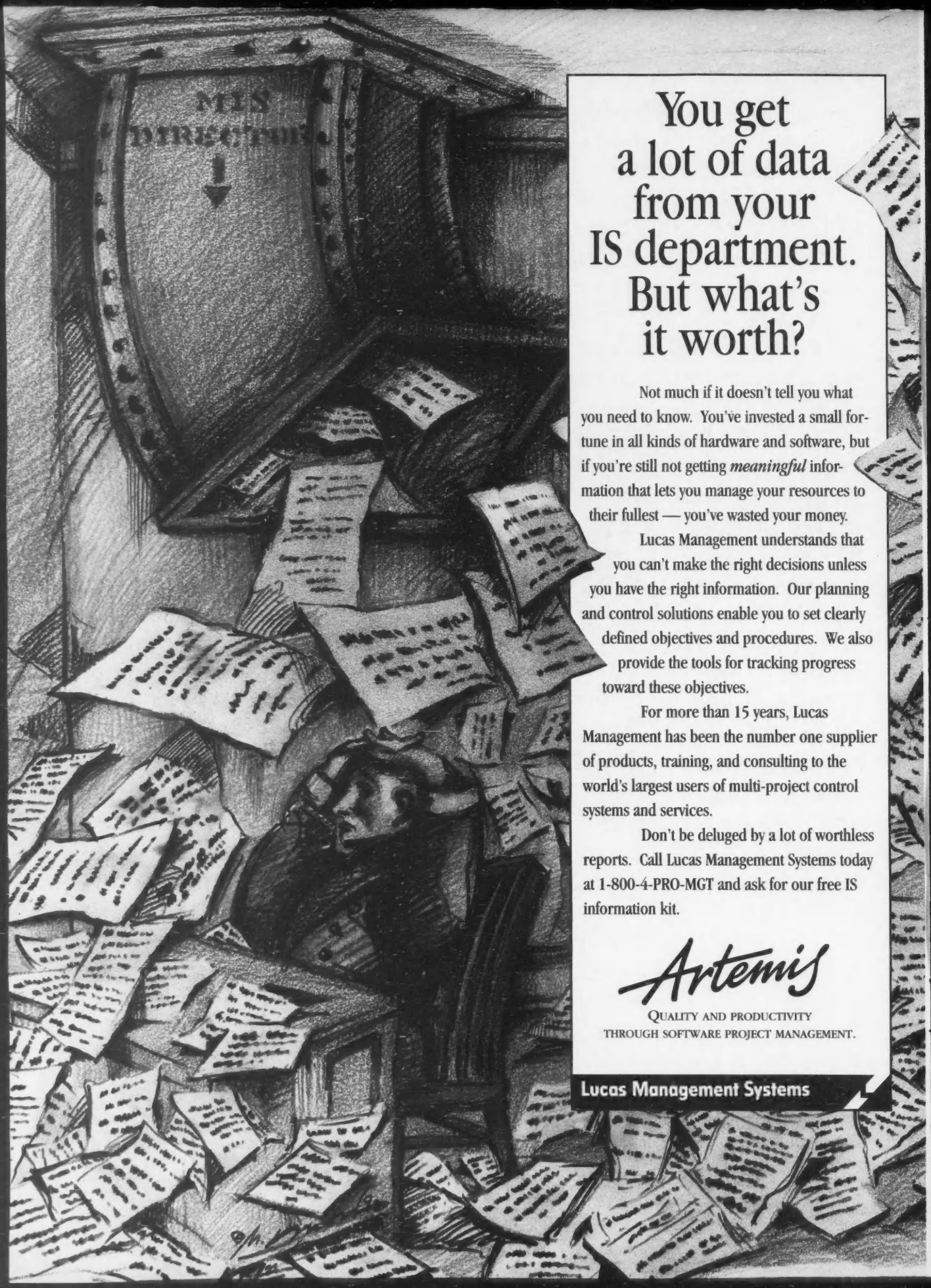
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Firms filling 3-D niche

CONTINUED FROM PAGE 45

new reduced instruction set computing (RISC) workstations with high-performance color graphics available at less than $25,000.

Most recently, Sun opened some of its internal hardware interfaces to encourage third-party graphics vendors to optimize performance of their products on the Sun platform. Sun also plans to integrate graphics acceleration technology in all its desktop models by the end of this year.

"There is enormous pressure on workstation vendors," said Carl Machover, president of Machover Associates Corp. in White Plains, N.Y., a computer graphics consulting firm. He estimates the worldwide market in graphics hardware and software is about $30 billion — roughly 10% of the overall computer market.

The pressure on users is also intensifying as vendors seek a proprietary advantage for the specialty graphics on their own "open" hardware, said David Pensak, corporate adviser for computer technology at Du Pont Co. in Wilmington, Del.

"We're seeing a lot of warfare between vendors now, and users run the risk of getting trampled," said Pensak, who deals with graphics products on seven different Unix workstation platforms. "All the vendors want to sell us their tool kits and widgets, but if you don't know what the widget is good for, you have no clue how to use it."

What customers really need, Pensak contended, is "a lot more worked-out examples and case studies of how these tools were applied to solve a problem."

Another pressure point for users is the proliferation of graphics standards — some officially blessed and some de facto by virtue of their popularity — which leads to compatibility problems when users try to move data around in multivendor environments.

One example Pensak noted is with PHIGS (Programmer's Hierarchical Interactive Graphics System), an international standard for 3-D graphics libraries that is designed to allow easy portability to many graphics systems. A PHIGS application on an IBM RS/6000, however, will not move effortlessly to a Sun workstation without tinkering with the source code to remove optimizing features added by each vendor, Pensak pointed out.

While the standards continue to sort themselves out, there is increasing demand for more realistic imaging, and the ability to manipulate images in real time requires faster and more powerful systems, analysts said.

"There is also very strong interest in the visualization aspect of business data," Machover said, noting how American Express is actively examining visualization systems from several vendors to help analyze dozens of variables used in determining creditworthiness.

"We're all looking to understand what is in our data," Pensak agreed. "There is a huge market out there in the business community. Vendors ought to stop calling it 'scientific visualization' and just call it data visualization."

NEW PRODUCTS

Micro-to-micro

Symantec Corp. has announced The Norton PCAnywhere Version 4.5.

PCAnywhere provides remote control of one personal computer by another via serial or modem connection. Version 4.5 supports Microsoft Corp.'s Windows 3.0 and DOS and includes a Quick Connect feature for faster linking of PCs.

PCAnywhere costs $179.

A version for networks, PCAnywhere/LAN, is also available. A two-node license costs $495.

Symantec
10201 Torre Ave.
Cupertino, Calif. 95014
(408) 252-3570

Local-area networking hardware

Cabletron Systems, Inc. has announced a manageable adapter that attaches an Apple Computer, Inc. Macintosh to Ethernet networks via the small computer systems interface port.

The adapter includes an intelligent processor that handles packet filtering and management functions to improve the Macintosh's networked performance. It allows slotless Macintosh Classics and Powerbooks to connect to Ethernet.

The basic model costs $419.

Cabletron Systems
35 Industrial Way
Rochester, N.H. 03867
(603) 332-9400

Wang Laboratories, Inc. has introduced the LAN Mobile Recovery System, a wireless network for emergencies.

The system can replace a wired local-area network in the event of a network failure. It is fully configured with software and hardware.

Pricing ranges from $4,000 to $5,000, depending on the number of users.

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Users rally for frame relay

BY JOANIE M. WEXLER
CW STAFF

WASHINGTON, D.C. — Users anxious to deploy frame relay discovered a deficit of both customer experience and resolution of outstanding issues at the first Frame Relay Users Roundtable held recently.

About 30 candidates for frame relay — a fast-packet-switching interface described as "X.25 on steroids" by one roundtable speaker — convened following the Communication Networks Conference and Exposition '92 to pitch questions to consultants, carriers and equipment vendors.

Many users, looking to deploy frame relay within the year, cited their concerns with the neophyte technology: network congestion control in both private and public networks, apples-to-apples pricing, and in public networks, degree of service ubiquity and a standard definition of a committed information rate (CIR), a loose term for the minimum amount of bandwidth guaranteed over a permanent virtual circuit.

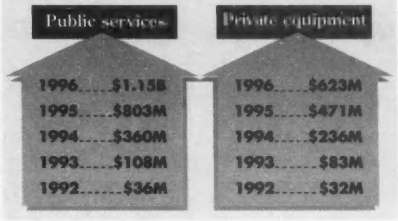
The vice president of strategic planning at a large New York bank, for example, was concerned that his Novell, Inc. Netware protocols "don't understand frame relay's flow

To page 64

The demand is there

Potential users say they need frame-relay communications, so the market should take off once the equipment and services are in place

U.S. frame-relay market projections



Source: Vertical Systems Group

Embryonic state

A user survey conducted by Vertical Systems Group revealed that frame relay is in "an embryonic state of deployment," said Rick Malone, principal of the consultancy, at the recent Frame Relay Users Roundtable. Vertical found just 30 to 40 existing worldwide customers and beta-test users of the technology, and it spoke with 10. Its findings are as follows:

- A nationwide user network of varying leased-line speeds costs a company $31,166 per month. Three service providers gave costs for the same speeds using frame relay, reflecting the following savings: Compuserve, 36%; Wiltel, 35%; Sprint, 18%.
- Generally, users hope to save 20% to 30% using frame relay instead of traditional leased lines.
- Applications now on frame-relay networks are generally not yet mission-critical.
- The most dominant protocols running across frame relay are TCP/IP and Banyan Systems, Inc.'s Vines.
- Half the users felt much of the network engineering burden for interoperability fell on their shoulders.
- No user had a good idea of network utilization, and all cited a need for better frame-relay network statistics.

JOANIE M. WEXLER

Bellcore chief outlines vision

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Bell Communications Research, Inc. (Bellcore) President George H. Heilmeier has called for the establishment of a national information infrastructure by the beginning of the 21st century.

Heilmeier said pervasive, broadband intelligent networks linking distributed object-oriented databases could offer universal access to a smorgasbord of multimedia information. For example, he predicted the emergence of "personal nomadic" information devices such as pocket-size wireless computers and telephones. Advanced intelligent networks would route information to people, not locations, he said.

Heilmeier also said there could be universally accessible information "malls" providing seamlessly integrated information "shops" for education, medical services, libraries, professional collaboration, software repositories and entertainment. Information would flow out of the shops as data, voice, video, fax or multimedia.

"I know of no other initiative that could have as great an impact on society," Heilmeier told a Communication Networks Conference and Exposition '92 audience.

He warned that unless government and industry groups consolidate their diverse agendas, the coordinated and well-funded information infrastructure programs in Japan and Europe may give those regions a decisive competitive edge in the next century.

Heilmeier described the proposed infrastructure as a major opportunity for U.S. businesses — not just the telecommunications industry — worth as much as $25 billion in this decade.



Heilmeier *foresees information 'malls'*

He said other information infrastructure proposals, such as those from U.S. Sen. Albert Gore (D-Tenn.) and Mitch Kapor, president of the Electronic Frontier Foundation, are constructive but narrowly focused — "tactical approaches aimed at pieces of the problem."

Heilmeier said the infrastructure should have these technical characteristics:

- All digital with broadband transport and switching.
- Distributed intelligence and high-speed signaling.
- Geographic independence for users and services.
- Interoperability of diverse networks and equipment.

Continued on page 62

IBM sees peer-to-peer future for processor

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — IBM recently made it clear that it intends for its 3745 front-end processors to be full partners in the upcoming generation of peer-to-peer Systems Network Architecture (SNA) networks — at least for the next decade. IBM spokesmen also dotted a few i's on the vendor's strategy to implement Advanced Peer-to-Peer Networking (APPN) on IBM front ends and VTAM hosts.

Past IBM statements of direction have promised a fast-packet switch, which — unlike existing IBM front-end processors — will be designed from the bottom up to support users' increasing need for high-speed, LAN-to-LAN, multiprotocol networking. At the Communication Networks Conference and Exposition '92 briefing, IBM senior technical staff member Jean Lorrain emphasized that the new switches — code-named Paris — will not supersede the 3745, at least until the front end's huge installed base is ready to move off it.

Indeed, IBM will continue to upgrade the 3745 to keep pace with users' networking demand, while they wait for Paris to become available during the next few years, Lorrain said. "I don't see the 3745 disappearing before [the year] 2000 and something," he added.

Nevertheless, the 3745 is an outdated communications architecture headed for the scrap heap, said Donald Czubeck, president of Gen2 Ventures, a Saratoga, Calif., consulting firm. "We're on verge of real quantum leap in bandwidth requirements, and 3745 and its predecessors were originally designed for voice-grade lines." While IBM has given the front end the ability to support T1 links, "once you get to gigabits per second, you blow that architecture out of the water," he said.

Continued support

IBM needs to continue supporting 3745's huge installed base for the next few years while it gets Paris into production, Czubeck said. Indeed, IBM developed the recently announced 6611 router "because users couldn't wait for the new switch," he explained. The Paris switch may end up incorporating both systems "because what users want are multifunction boxes, not separate front ends, hubs and routers," he said.

One major enhancement will enable the front end's Network Control Program (NCP) to fully participate in an IBM APPN network, automatically keeping track of resources on other APPN nodes and routing requests to other nodes, Lorrain said. However, "peer-to-peer" is somewhat misleading here because the host will still be involved. VTAM on the host "will do most of the job" in terms of coordinating APPN transmissions for one or more NCP systems, Lorrain said.

The end result will be the "seamless joining" of IBM's hierarchical 3270 applications with the peer-to-peer SNA world, he added.

IBM is also grooming the 3745 to act as a frame-relay node that can interact with other frame-relay switches, including both the Paris switch and Network Equipment Technologies Corp. Integrated Digital Network Exchange switches that IBM resells. Two weeks ago, IBM announced that by September, the 3745 will support the Data Terminal Equipment protocol, so that it can act as a multiplexer that passes on transmissions to a frame-relay network. Less than a year after that, the front end will be able to act as a frame-relay switch in its own right, Lorrain said.

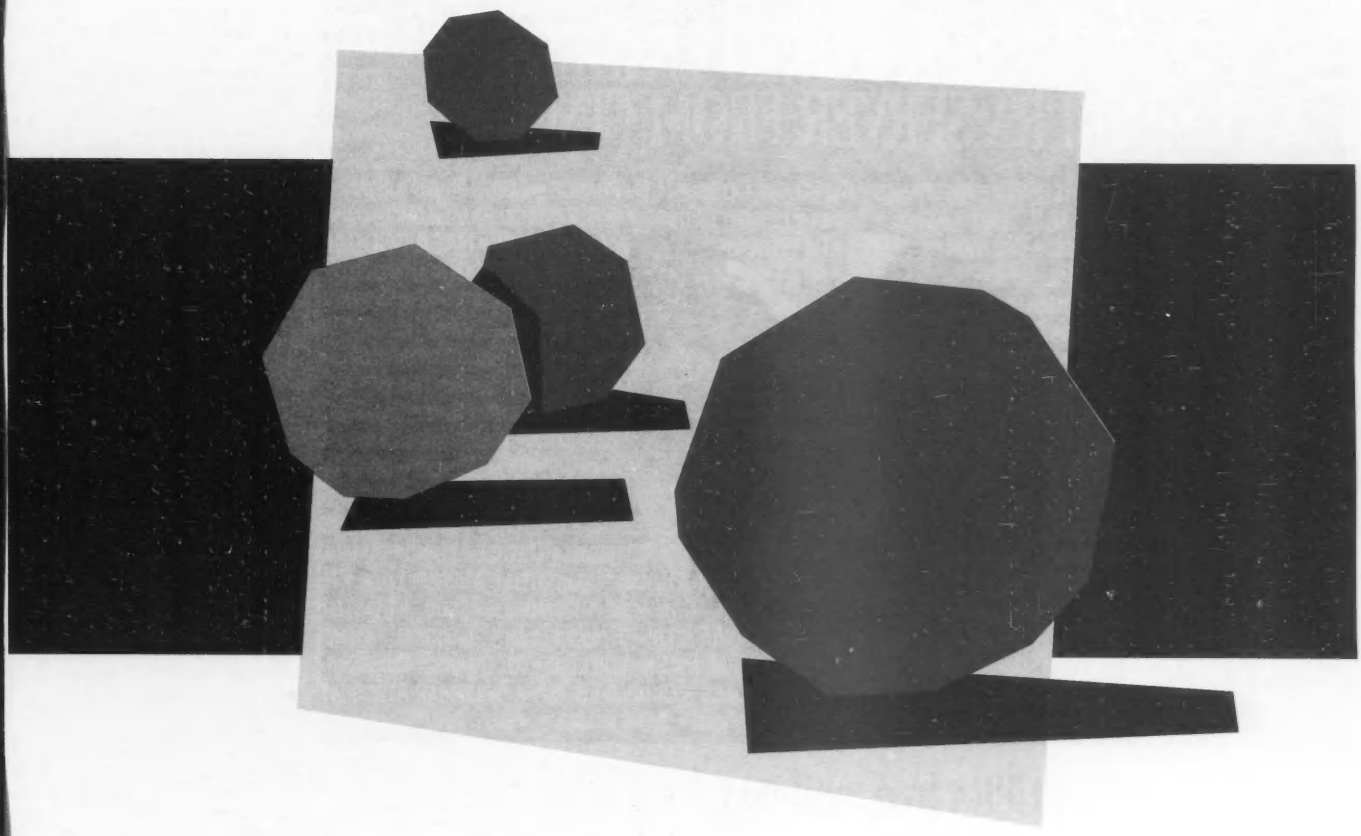
However, the 3745 will probably not have true bandwidth-on-demand fast-packet capabilities, Czubeck said. "Users will probably have to allocate bandwidth ahead of time for applications on the 3745. With Paris, you will have a true, high-speed communications processor that channel attaches to mainframes, over [IBM's] Escon," he said

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3Com bids for BICC business

BY JOANIE M. WEXLER
CW STAFF

SANTA CLARA, Calif. — The most recent round in the dog-eat-dog smart hub arena saw 3Com Corp. bid to buy a big chunk of European market share recently by agreeing to purchase the data networking products business of the UK's reported hub leader, BICC Group PLC.

The move, expected to be completed next month for $25 million in cash and 500,000 shares of 3Com stock worth about $5 million, should render 3Com the fourth-largest hub maker behind heavyweights Cabletron Systems, Inc., Synoptics Communications, Inc. and Ungermann-Bass, Inc. (UB), according to Boston-based consultancy The Yankee Group.

In 1990, 3Com had about 2% of the worldwide hub business, while BICC trailed just Synoptics and UB in Western Europe with 14.6% of that market, according to International Data Corp. (IDC), a research firm in Framingham, Mass.

Intelligent wiring centers — or smart hubs — are one of the fastest growing segments of the networking industry, as users line up to install the devices for the network management capabilities inherent in physically star-wiring a variety of network topologies. The low- to high-end range of hubs from 3Com is primarily Ethernet-oriented. "What BICC adds is a line of hubs under construction that supports multiple networks," 3Com President Eric Benhamou said.

Offering a range of hubs supporting an array of media and ports is important for users with differing hubbing needs at different company locations. Benhamou said his company intends to provide Token Ring support "across the board, from the low to high end, in 1992."

With the BICC move, 3Com "has paid $30 million for an estimated $60 million to $70 million in business next year," said Todd Dagres, The Yankee Group's director of data communications research.

Hub strides

The proposed purchase is the third in a series of major hub strides for 3Com, which shifted its business away from network operating systems and into the internetworking business about 18 months ago. The first was the announcement last summer that it would codevelop a high-end intelligent wiring hub with local-area networking company Synernetics, Inc.

Those products, based on Synernetics' Ethernet-to-Fiber Distributed Data Interface (FDDI) multiplexing technology, aimed to ease users into 100M bit/sec. FDDI networking and became generally available two weeks ago, according to Benhamou. He said the Synernetics relationship is "completely unaffected by this transaction."

The second move was last fall's introduction of the 10BT and 10BTI line of 10Base-T hubs, which can be daisy-chained together to support growing numbers of twisted-pair Ethernet networks.

Chip Pettirossi, a LAN analyst at IDC, said that with 3Com's OEM relationship with Synoptics and its codevelopment undertakings with Synernetics, "there might be confusion as to what's going to be offered and who will be offering it."

But Benhamou said "there is absolutely no overlap; the BICC products are 100% complementary" to 3Com's existing line.

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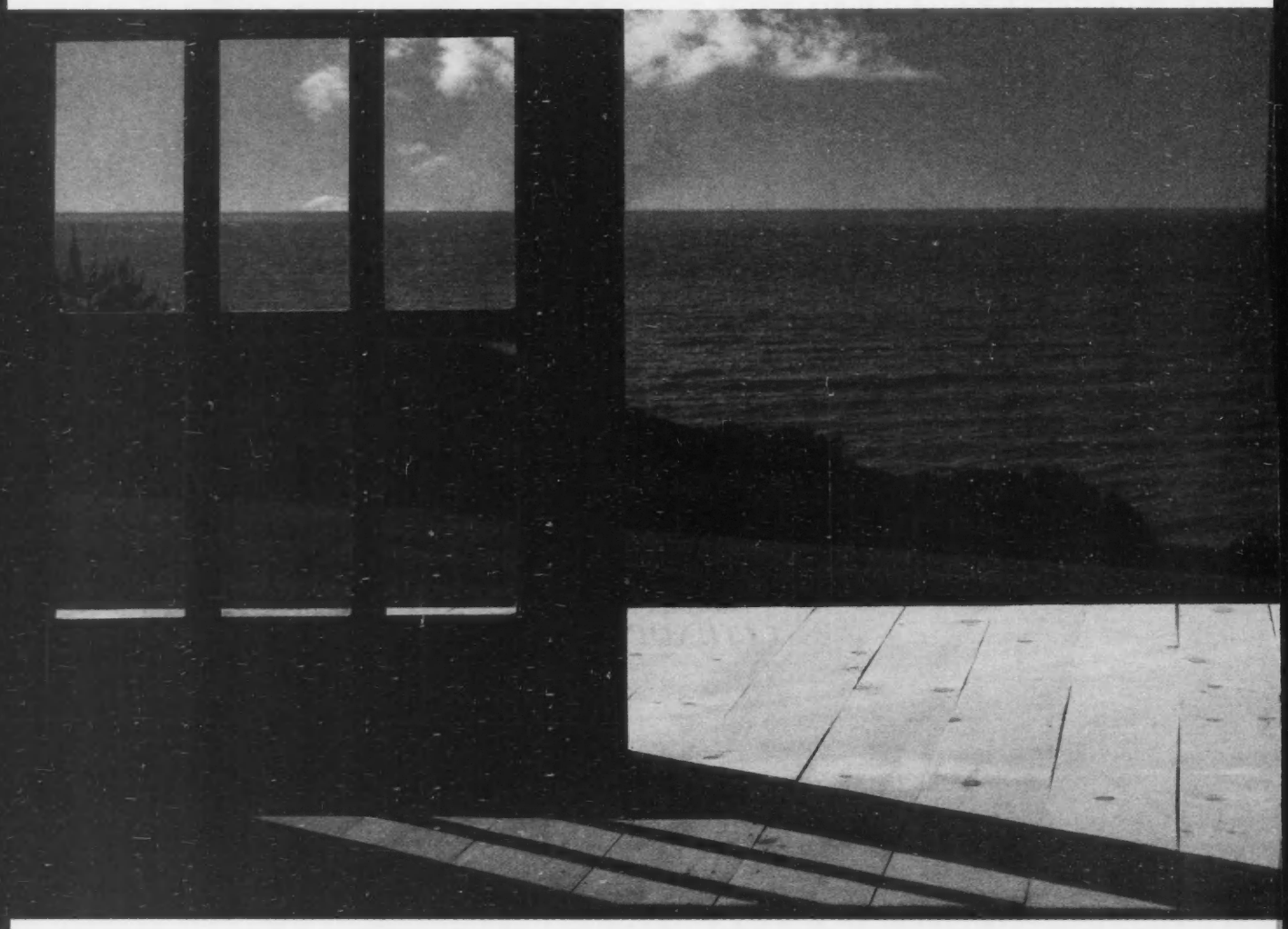
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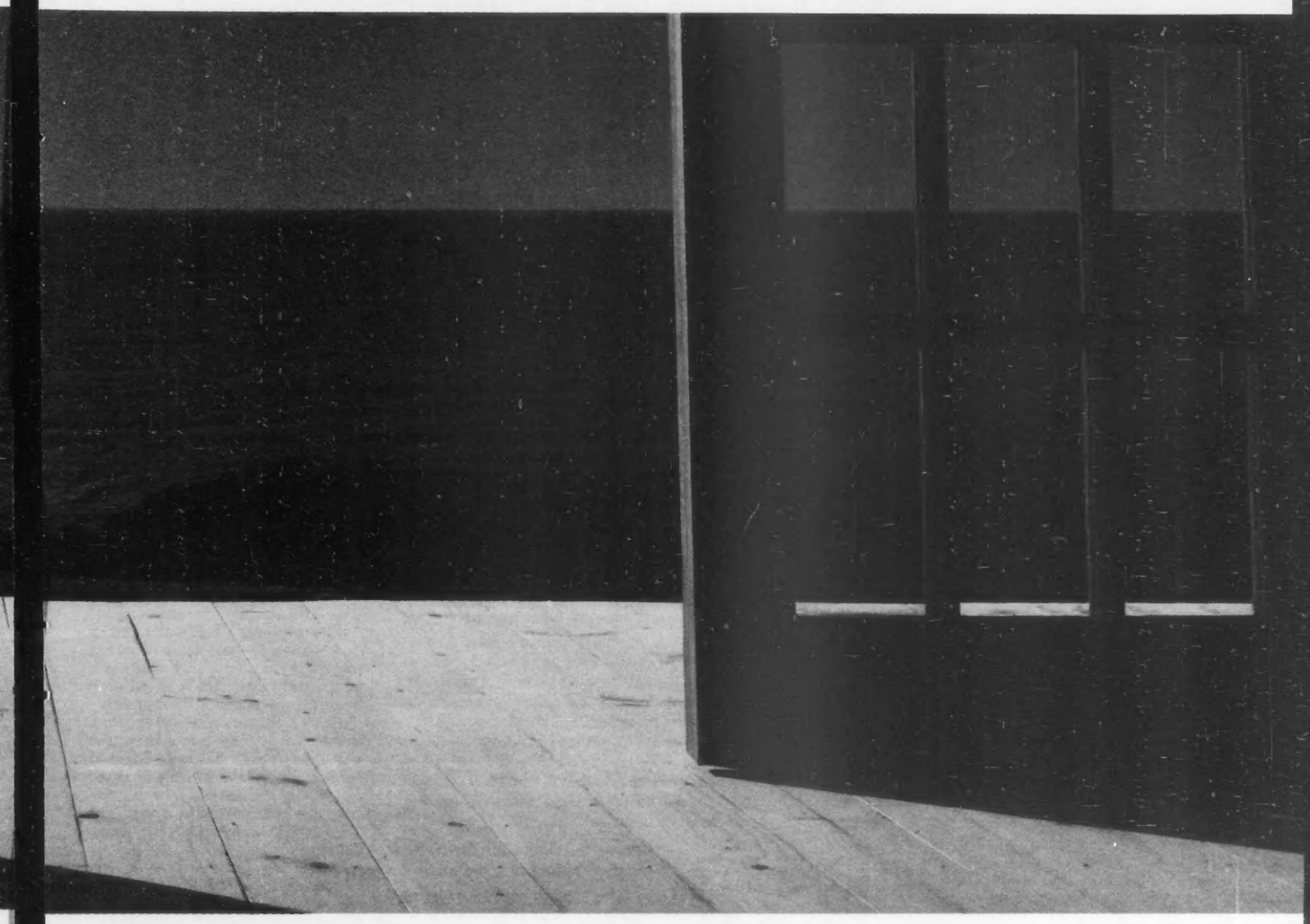
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good, but not everyone agrees how to get there.

nications with customers and suppliers, who no doubt planned their systems without thinking about yours.

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Net managers call for better stats

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Network managers, spooked by the public network outages of 1991 and disappointed with the caliber of carriers' service technicians, are pressing the Federal Communications Commission to do a better job of collecting and publishing service quality statistics.

"What we're seeing is the level of service quality deteriorating, and we're very concerned about that," declared Donna Kwak, chairman of the Tele-Communications Association (TCA), at the Communication Networks Conference and Exposition '92 last month. TCA is a user group with more than 1,000 members.

Kwak, who is senior vice president at Phoenix-based Chase Bank of Arizona, spoke out during a "town meeting" on the topic of local exchange competition. She said users generally favor the emergence of competition in the local loop — hoping for lower prices and better service — but they also worry about the effects on network reliability for those "stuck" with a monopoly carrier.

Because of cost-cutting pressures from regulatory price caps and emerging competition, local telephone companies are sharply reducing their work forces and losing their most experienced technicians, Kwak said. Furthermore, TCA members are finding it more difficult to get prompt action on service calls, and they saw the number of public network outages increase nearly 20% from the second quarter to the third quarter of 1991.

The FCC, responding to the rash of network outages, proposed new reporting requirements last September. Under the proposal, carriers would have to report within 90 minutes any network outage that affects at least 50,000 customers and lasts for 30 minutes or more.

The TCA blasted that threshold as too high. The FCC proposal covers "only the most catastrophic and headline-grabbing network outages — system crashes of such magnitude that notification, while important, is hardly essential to attract regulatory attention," said the TCA filing, which suggested a much lower threshold.

Kwak said local carriers should also publish the internal standards they use to determine service quality, so users can compare their local carrier to others around the country.

"I'm not sure that's such a bad idea," responded James R. Young, a vice president at Bell Atlantic Corp., but he stressed that the statistics must compare "apples to apples." He added that Bell Atlantic's outage last year was caused not by cost cutting or price caps, but by a vendor's software bug that appeared when the carrier was modernizing its network.

Royce J. Holland, president of Metropolitan Fiber Systems, Inc., an alternative local-access carrier based in Oakbrook Terrace, Ill., said the government should be "shining the spotlight" on network quality by publishing statistics much like the ones it publishes on airline performance.

Competition from alternative carriers will provide a "competitive stick" that will prod the traditional carriers to improve their service quality, Holland said.

Just the biggies

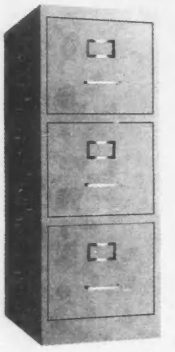
Of these 586 network switch outages, only two would have qualified under the new proposal as big enough to report to the FCC

Carrier reportable*	GTE/ Contel	Bell-south	United Telecom
Number of outages (Q3 1991)	462	72	52
Average duration (minutes)	46.8	56.3	47.6
Outages under FCC	0	2	0

*Proposal: Limits reports to outages affecting at least 50,000 lines for at least 30 minutes.

Source: Tele-Communications Association

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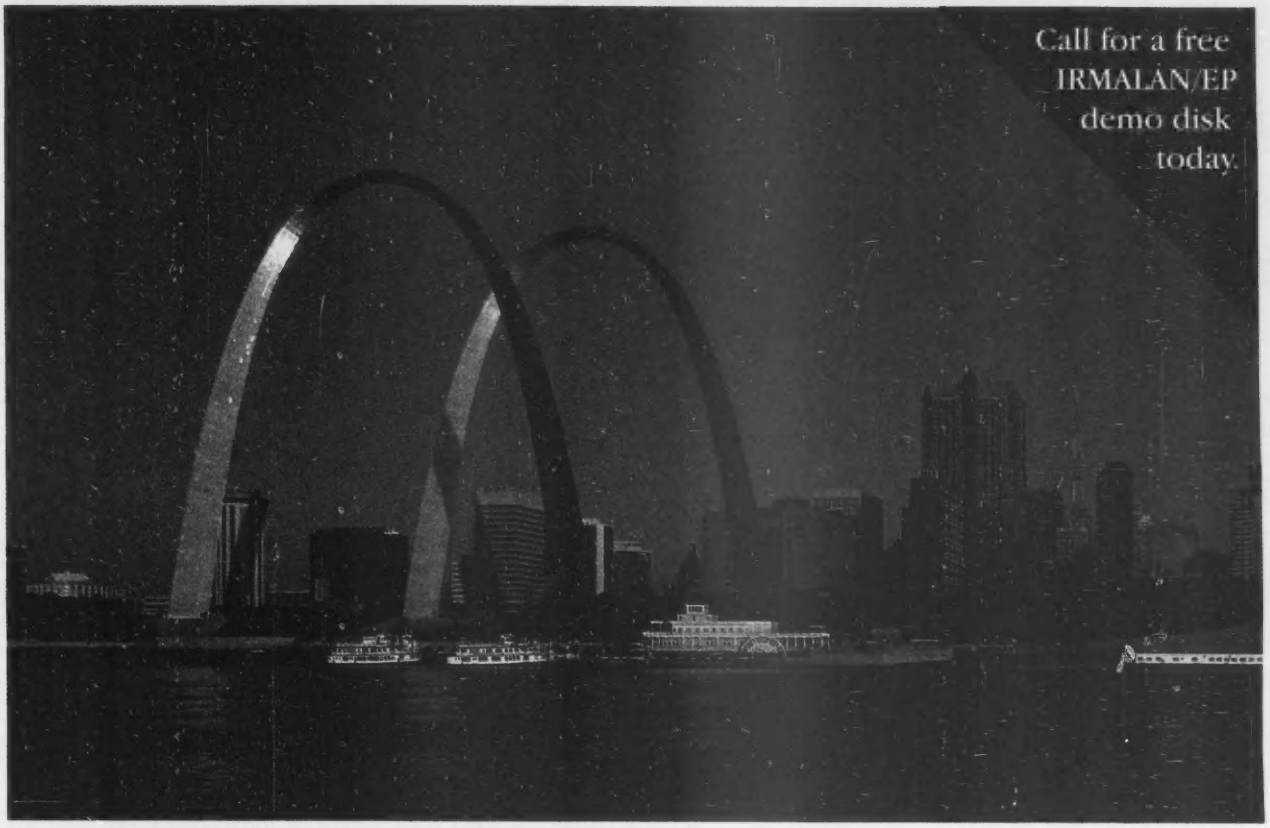
Bellcore head outlines vision

CONTINUED FROM PAGE 55

• Transparent complexity — "common look and feel" interfaces.

Pointing to existing infrastructures such as railroads and airlines, he said building the information infrastructure will require international standards, public and private investments and a favorable tax and regulatory climate. In particular, he said, "Congress should pass a national information infrastructure act to propel us into the 21st century, just as the 1934 Communications Act propelled us toward universal telephone service."

The act would promote the development of standards, consolidate diverse government efforts, foster government-industry academic research, grant antitrust exemptions for industry partnerships and provide guidelines for tax incentives.

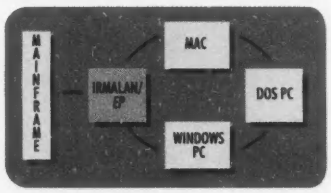


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Report says wireless market will boom

BY ELLIS BOOKER
CW STAFF

Wireless data services will grow from the current $145 million market to a $1 billion market within the next 10 years, according to a recently released paper.

"The Wireless Industry Prospectus," a quarterly publication produced by Wilmette, Ill.-based Datacomm Research Co., concludes that electronic messaging will be the "killer application" to bring mobile and portable data systems to a wide swathe of workers and consumers.

The report bets squarely on the success of two-way systems, noting that only two-way communications offers advantages such as receipt confirmation, automatic roaming and the option — on the part of the recipient — to respond immediately.

However, the study also addresses the obstacles to this attractive technology, which include the following:

- A perceived lack of security.
- The absence of corporate systems/applications designed to work with wireless workers.
- Resistance among field employees.
- The difficulty of isolating productivity gains from field automation systems.
- Proprietary systems from hardware vendors and wireless network providers.
- Management's reluctance to invest in field automation during hard times.

The study compares the three major types of mobile data transmission — private and shared radio networks and common carrier cellular networks — and their hardware costs and requirements. The study also gives an update on the hardware, software and carriers in the wireless arena.

The next installment of the prospectus is slated for May.

Users rally for frame relay

CONTINUED FROM PAGE 55

control mechanisms."

Andrew S. May, director of marketing network services at public service provider Compuserve, Inc., acknowledged that "some protocols [particularly Transmission Control Protocol/Internet Protocol] are transported faster, and it might be advisable to structure your protocols in a certain way" for greater efficiency.

Steven A. Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C., advised users concerned about congestion to use higher level protocols that have a selective retransmission feature. If a data frame gets dropped because of a traffic bottleneck and the protocol in use requires that packet and all those following it to be retransmitted, he said, "you'll make the congestion worse."

Congestion is a particular problem with frame-relay networks because frame-relay protocols, unlike the more intelligent X.25, reside at the lower two layers of the Open Systems Interconnect model. "You have a network of uncontrollable devices, so it's hard for the network to find which device on a LAN is causing the congestion," Taylor explained.

CONGESTION IS A problem with frame-relay networks because they are composed of unmanageable devices.

Eva Miller, a computer specialist at Geological Survey, a division of the U.S. Department of the Interior, said she is concerned with comparative pricing and service availability. Her department is currently in beta testing with network service provider Wiltel, but she said it is "difficult to compare one vendor to the next" because of inconsistent pricing structures.

Taylor added that once internetwork standards are in place and users' traffic traverses multivendor networks with disparate pricing schemes, "How do you get billed for that?"

A senior scientist at a large electronics and appliance manufacturer expressed frustration at the varying definitions of public service vendors' CIRs.

For example, U.S. Sprint Communications Co. offers two options: a reserved bandwidth option and a standard service where users "blast data and pray," said Rosemary Cochran, a principal at consultancy Vertical Systems Group in Dedham, Mass.

However, Cochran said, it is not clear with the reserved option if the access pipe at the receiving end "will allow you to get that rate end-to-end."

There are about 75 frame-relay equipment and service providers today. Currently, none of the "big three" long-distance carriers or regional Bell telephone companies have a paying frame-relay customer. In addition, AT&T, slated to roll out its service midyear, has yet to provide any pricing details.

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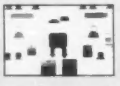
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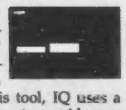
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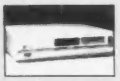
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Forest Computers will be exhibiting high performance IBM, DEC, and UNIX connectivity products. Forest Computers offers solutions for integrating IBM mainframes, IBM midrange (System/3X, AS/400), DEC VAX, and UNIX computers using an intelligent network device that bridges IBM, SNA, DECnet, and TCP/IP networks. These products provide high-speed file transfer, full featured bidirectional terminal access, electronic mail exchange, program to program communications, printer sharing, and remote job submission between IBM, DEC, and UNIX systems.

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Able Communications

Able Communications will introduce the PE 250, a new dual protocol network gateway. This is a LAT and TCP/IP ethernet gateway supporting up to 256 ports. Also being introduced will be the CS256 Concentrated Server which will be capable of supporting up to 256 ports for terminals, PC's and printers. ABLE Communications is a leading edge manufacturer of connectivity products and data communication networks.

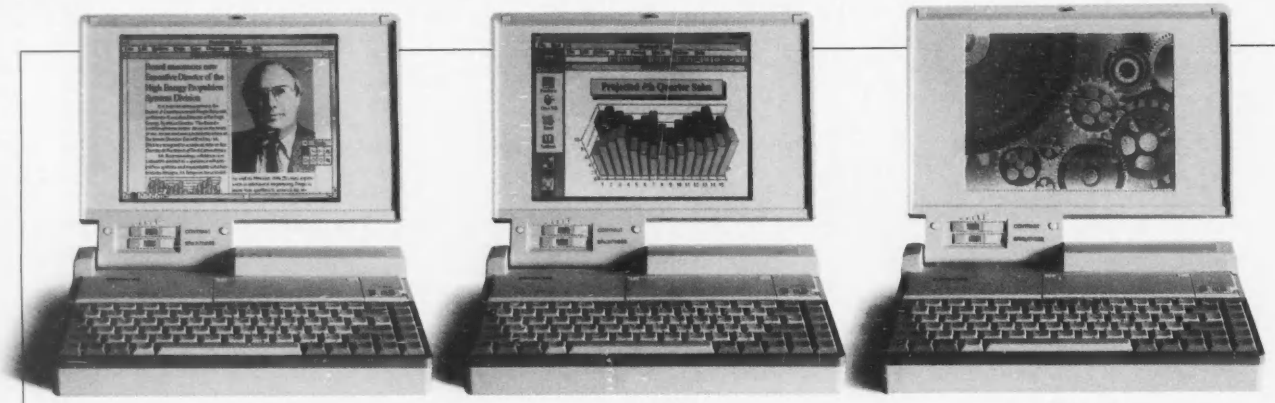
Micro Technology, Inc.
Micro Technology will unveil the latest in its line of quality enhancement products in networking, storage subsystems, and system software for the VAX/VMS and UNIX environments. Micro Technology will demonstrate FailSafe, the industry's first and only CI attached RAID 5 solution. FailSafe provides the user with a dual CI data path and 100% fault tolerance, while never losing data due to a hardware failure. Additionally, Micro Technology will unveil its new system software solutions for VAX data management environments and its innovative tape library. Called Virtual Tape Library (VTL), this comprehensive library management software will automate backup archival and Sideline™ applications. VTL supports from 50 GB to 580 GB of tape storage.

Dataram

Dataram will feature its DR300E memory in 16MB and 32MB versions for DEC's MicroVAX 3x00, DECsystem 5400 and VAX 4000 Model 200. In addition, Dataram will exhibit its DR600 for VAX 6000 computers, DR400 for VAX 4000s, DR5500 for the DECsystem 5500, DR5100 for the DECsystem 5100, DR5000 for DECstation & DECsystem 5000s and its DR3100 memory family for the 3100 series MicroVAX, VAXstation and VAXservers.

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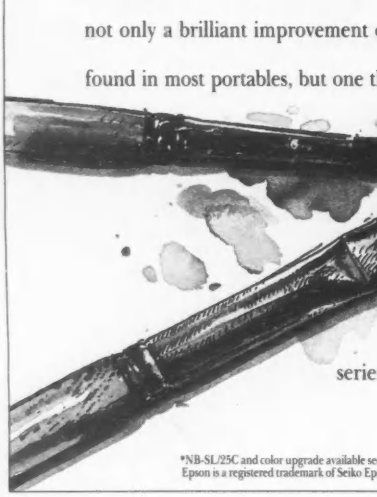
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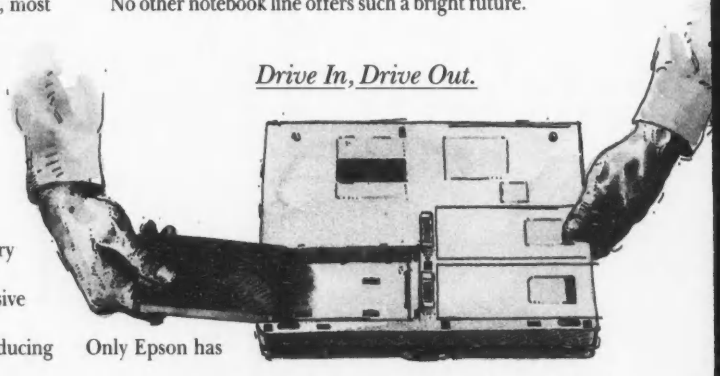
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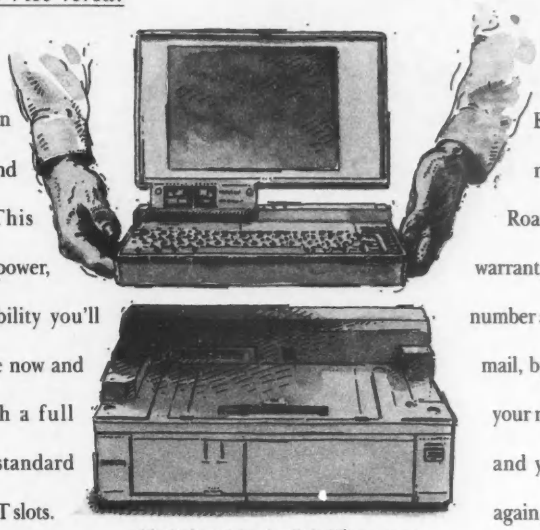
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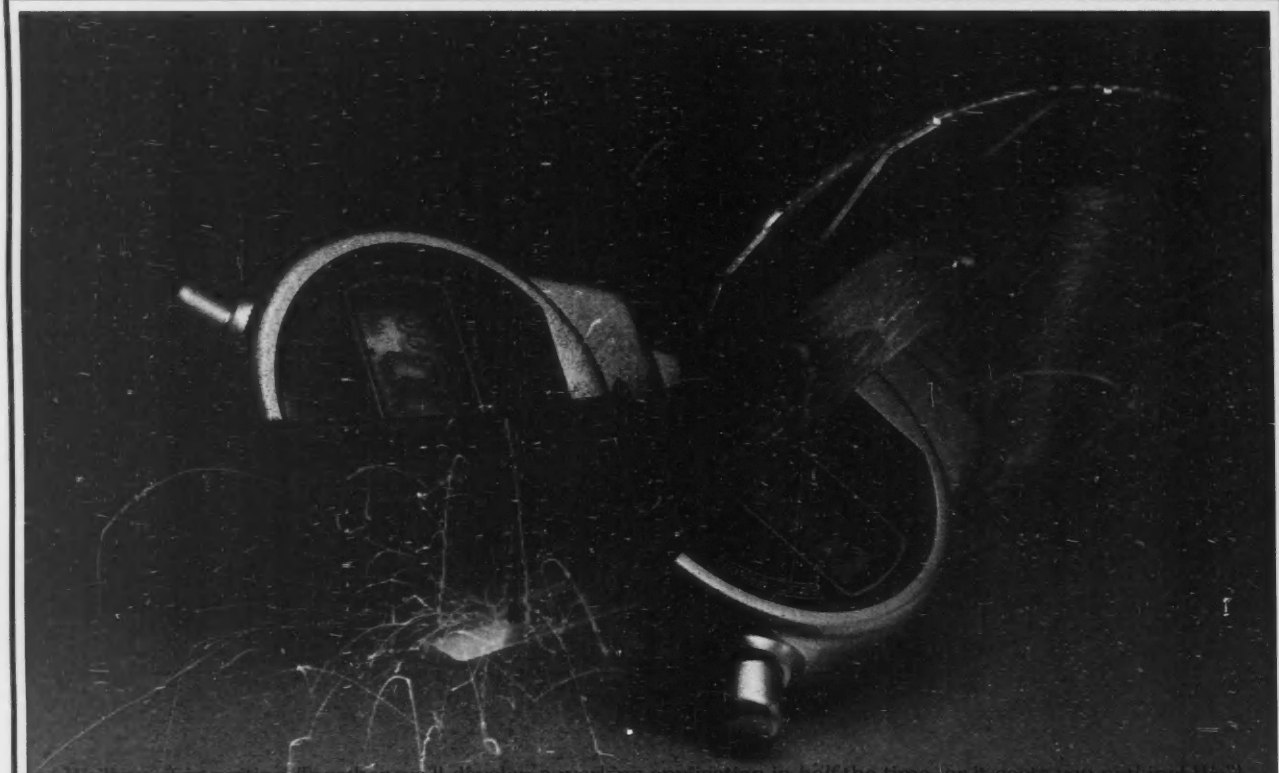


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IN BRIEF

Cincom extends support

■ Users of **Cincom Systems, Inc.**'s Control: Manufacturing software now have 24-hour access to Cincom technical support via a worldwide telecommunications network. Called Cinternet, the service includes electronic mail, on-line bulletin boards and a technical product database and source code that contain resolutions to problems. There are no initial fees for current Control:Manufacturing users; connect-time charges start at $50 per hour and other fees vary.

■ **Mentor Graphics Corp.** in Wilsonville, Ore., announced it will port Version 8.0 of its design automation software to new platforms. These include workstations from Digital Equipment Corp., IBM, NEC Corp. and Sony Corp. The timetables depend on the workstation and the package being ported. When the ports are completed, Mentor said, its software will be available to more than 90% of the worldwide Unix workstation market.

DEC aims at AS/400 with new Microvax

BY SALLY CUSACK
CW STAFF

MAYNARD, Mass. — Trying to outstrip the proprietary midrange competition in price/performance — in this case, IBM's Application System/400 — Digital Equipment Corp. has launched its next-generation Microvax computers, as well as Posix software, hoping to attract customers and independent software vendors with cheaper, faster and more open systems.

The Microvax 3100 Model 30, Model 40 and Model 80 were designed to provide multiuser desktop computing with increased price/performance for the commercial marketplace.

According to the Transaction Processing Council's Benchmark A results, the high-end Model 80 system tested at 27.9 trans./sec. and $10,166 per trans./sec., and the Models 30 and 40 systems were measured at 21.6 trans./sec., achieving $10,900 and $10,969 per trans./sec., respectively.

Microvax 3100 family at a glance

Model	VAX units of performance	Min./max memory	Max. storage	Price
10E	3.5	4M to 32M bytes	5.2G bytes	$6,314
30	5.0	8M to 32M bytes	6.8G bytes	$8,790
40	5.0	8M to 32M bytes	6.8G bytes	$11,490
80	10.0	8M to 72M bytes	6.8G bytes	$18,500

Source: Digital Equipment Corp. CW Chart: Marie Haines

DEC has also reduced the price of the entry-level Model 10E, introduced in October 1990, by approximately $1,000. Meanwhile, DEC said it will discontinue the previous low-end 3100, the Model 20, later this year.

William Sines, director of midrange systems and server research at Technology Investment Strategies Corp., a research firm in Framingham, Mass., said the competitive price and increased performance of the new systems, combined with increased I/O from the small computer systems interface (SCSI) disk, would make the new systems "very competitive" against IBM's AS/400 Model D computers.

Sines also predicted that the new systems will "hold their own" against IBM's anticipated next-generation AS/400 E series machines, rumored to be introduced later this month.

Continued on page 74

SAS rolls out series of new tools, upgrades

BY GARY H. ANTHES
CW STAFF

CARY, N.C. — SAS Institute, Inc. last week began shipping a new release of its SAS System for Information Delivery to 8,000 IBM mainframe and 3,400 Digital Equipment Corp. VAX sites. Beta-test users said the software offers substantially improved performance, bug fixes and useful new capabilities.

In addition to its enhancements, Release 6.07 includes eight new products.

The company said it already has enough orders booked for the IBM mainframe version of SAS/Calc, its new spreadsheet package, to make it the largest selling spreadsheet product for MVS systems and the second largest for CMS environments.

Questar Service Corp., a Salt Lake City gas utility, is using a test version of SAS/Calc for financial analyses. "Most of our data is up on the [IBM] host, so why drop it down to the PC for spreadsheet analysis and then ship it back?" asked Ron Ford, senior programmer/analyst.

Ford said one Questar analyst has found SAS/Calc to be an easy way to combine data from different sources, saying, "You can collect IMS data or DB2 data or whatever, bring it into SAS data sets and from there fetch it into SAS/Calc."

SAS/Calc has 120 financial, mathematical and statistical functions, has windowed displays, maintains and reports data in three dimensions and requires $4,125 to $20,900 for a first-year IBM mainframe license.

Several users cited improved SAS performance. Calling the previous release "a little bit of a resource hog," John Shelby, manager of technical services at LTV Aerospace & Defense Co., estimated that the base system runs about 20% faster. "That is the key selling point for us," he said.

Ray Bass, manager of the Information Center at the Columbia-Presbyterian Medical Center in New York, said Release 6.07 brought with it some welcome bug fixes. An SAS reporting/writing procedure for interactive and batch reporting had been "a bit buggy" but "now works beautifully," he said.

SAS announced SAS/EIS, an object-oriented development environment for building and maintaining executive information systems. The product will be

Continued on page 74

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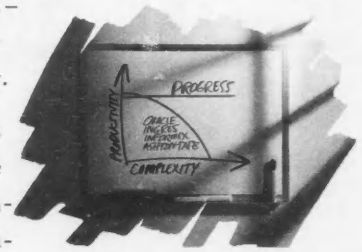




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APPLICATION DEVELOPMENT

Reports from front fuel anti-CASE fire

BY KIM S. NASH
CW STAFF

Carping about the failure of integrated CASE to fulfill user expectations is on the rise.

A recent report from Forrester Research, Inc. proclaims that if it is not already dead, integrated computer-aided software engineering (I-CASE) has at least keeled over in a lot of big firms.

"Death of Big CASE," Forrester's survey of 50 Fortune 1,000 sites, predicted that "little CASE," or single modules that may use object-oriented technology for tackling specific phases of software building, will leap over I-CASE and into user development plans.

However, despite the negative air surrounding it, I-CASE has proponents. "We're getting to be believers that some CASE technology does wonders," said Barry Larsen, director of systems and data processing at the Wisconsin Department of Transportation in Madison.

The department built a new driver's license system with Texas Instruments, Inc.'s Information Engineering Facility. The application, which Larsen said is the largest transaction-based system his group operates, runs on an IBM 3090 mainframe.

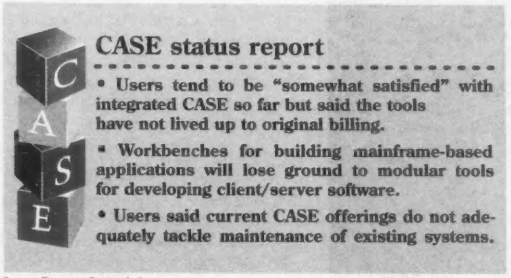
But that is just it, according to Stuart Woodring, director of software strategy research at Forrester. Mainframe-oriented CASE does not meet the needs of users who are increasingly looking to build new systems or modify old ones for distributed computing, he said.

Some users agreed. "What of the shops that have ditched mainframes — don't they get to do I-CASE?" wondered Robert Gauf, manager of MIS research and planning at The Brick Warehouse Corp.

The furniture retailer, based in Edmonton, Alberta, is evaluating ways to convert its "monolithic" PL/1 applications to C, for use on Data General Corp. Aviion servers and workstations. Gauf has done extensive research and/or testing of various I-CASE and modular tools but has yet to find a Unix-based development approach that meets his criteria.

Most Unix CASE currently available is for scientific, real-time development, he said.

Gauf said his "biggest hold-up" is the lack of a global repository for a Unix host. AD/Cycle was designed for IBM mainframes, and other massive data dictionaries have yet to cross over to Unix, Gauf said.



Source: Forrester Research, Inc. CW Chart: Michael Siggins

Lead balloons

Among the reasons I-CASE got a bad rap, according to the Forrester report, are the following:

• **What client/server?** I-CASE has "myopically" focused on developing host/dumb terminal applications, which few future-oriented companies would embrace as a strategic commitment. The big CASE makers have followed the small upstarts in addressing user interest in client/server computing by coming out with graphical user interface builders. But even only a few of the smaller vendors, such as S/Cubed, Inc., peddle tools to help erect distributed applications.

• **Training a drag.** Many users surveyed had fuzzy perceptions about what CASE is. Customers often have to buy lengthy training sessions when they make a deal with an I-CASE vendor, which is a heavy, albeit necessary, investment.

• **Unhappy together.** Vendors have gone nowhere fast when it comes to making their tools interoperable. CASE standards-making bodies exist but are slow in laying down specifications for getting one vendor's modules to talk to another's.

KIM S. NASH

Oracle to update SQL programs, RDBMS V.7

BY JEAN S. BOZMAN
CW STAFF

BURLINGAME, Calif. — Oracle Corp. recently gave industry analysts a sneak preview of colorful, icon-based applications that can be built with a new generation of Oracle tools but cautioned that the products are not ready to be shipped.

However, users anticipate revised versions of the two most widely used Oracle tools — SQL*Forms 3.0 for on-screen data entry forms and SQL*Reportwriter for printed output. The SQL*Forms 3.0 and SQL*Reportwriter products are about 3 years old. The new andimproved tools are said to be integrated and able to work against databases other than Oracle, as long as the outside databases interface with Oracle's SQL*Connect gateway product. All tools shown will be shipped this year, Oracle said.

But Oracle's history of first porting to some platforms, then staging the products to others, could slow shipments to many users. Perhaps more pressing is the expected shipment this summer of Version 7.0, a major revision of the core relational database management system for distributed applications.

"SQL*Forms 3.0 will still run against Version 7.0," said Geoff Girvin, vice president of the International Oracle Users Group. "Most people who are doing heads-down development would prefer to have Version 7.0 first and to wait for SQL*Forms 4.0."

Oracle may upgrade the SQL*Forms 3.0 package to add new functionality and ease of use. "When Oracle brought out its [financial] applications products, it began to use its own tools to develop applications," said Michael Corey, president of the user group. "So, the [need for] quality of Oracle tools went up greatly, and they realized they really had to go into the mainstream of tools development."

Oracle applications users have been told to wait for SQL*Forms 4.0 and skip SQL*Forms 3.0. Right now, Oracle's applications products work with SQL*Forms 2.3 or with Oracle's Application Foundation tool kit, a package that only works with applications products. Future releases of the Oracle Financials and Manufacturing applications reportedly will not be entirely compatible with SQL*Forms 3.0.

The addition of color and icons will certainly brighten user screens, but many users are not clamoring for color right now. "Oracle's just trying to stay in line with industry trends," said Ronald Drew, manager of systems development at Coca-Cola Bottling Co. of New York. "As PCs become very, very powerful, the new functions will become increasingly important."

The products demonstrated include the following:

▶**SQL*Forms 4.0**, a revised version of the SQL*Forms 3.0 applications development tool, which will incorporate bitmapped graphics for the first time. Icons can be used in the new database-query forms, including radio buttons, push buttons and multimedia icons. As shown, SQL*Forms 4.0 supported scanned 24-bit images and color.

▶**SQL*Reportwriter 2.0**, which also supports color graphics and icons. Users can use it to preview printed reports and to view the SQL statements that are used to gather data from the Oracle database.

▶**Oracle Graphics 2.0**, a layer of software that can be tapped by the other Oracle tools. The intent of the product is to allow users to convert character-based user interfaces to graphical user interfaces. The package supports icon-based menus and 50 types of charts.

Windows tool keeps Cobol

BY JOHANNA AMBROSIO
CW STAFF

Figuring out what is in an old piece of code, particularly if someone else developed it, is rarely a pretty sight. A start-up vendor hopes to both beautify and simplify the task with a tool that runs on a personal computer and maintains mainframe applications.

Seec/Care Cobol Analyst, from Seec, Inc. in Pittsburgh, is based on Microsoft Corp.'s Windows and generates a structure chart that shows the old program's flow. The package also includes global search and cross-referencing features that allow users to locate specific subject areas and rename old references and names.

The tool captures information about programs written in IMS and VSAM and stores the information in a data dictionary. Users can also identify the variables and conditions that control program execution, the company said.

Chris Hoke, an assistant vice president at Nationsbank in Norfolk, Va., said he has been testing Cobol/Analyst since September and is now "moving it into a more controlled environment for some of our programmers so they can give it their acid test." So far, he said, he has found it an effective "discovery tool that lets you figure out certain things about programs."

Big time saver

Randy Worthington, a project coordinator at Bridgestone/Firestone, Inc. in Akron, Ohio, said he has used Cobol/Analyst on about 25 mainframe programs, and tasks that used to take him half a week now take only one or two hours.

"I consider it a real boon; there's a tremendous advantage with the graphical interface," he said. "It works the same way I think." He has 10 more copies on order to give to programmers, he added.

Worthington said he found Cobol/Analyst particularly helpful for change management, to assess the possible impact of a requested change on an existing application.

Currently shipping, the tool supports Windows 3.0 and 3.1 and runs on IBM 286 PCs, IBM Personal System/2s and compatibles.

Cobol/Analyst is priced at $499 for the VSAM version and at $699 for the IMS version, which includes VSAM.

Seec was founded in 1988, but Cobol/Analyst is its first product. A second product, a reverse-engineering tool, will be introduced later this month.

DEC aims at AS/400 with 3100

CONTINUED FROM PAGE 69

The 3100 series incorporates a 4M byte/sec. SCSI bus, as well as single in-line memory modules or easy memory upgrades, the vendor said.

The systems can also function as servers and allow for the integration of MS-DOS and OS/2-based personal computers, Apple Computer, Inc. Macintosh systems and Unix workstations via DEC's Network Application Support software.

One of the first customers for the new computer series is Aetna Life and Casualty Co., based in Hartford, Conn. Aetna has ordered eight Model 40s to support a customer desktop health care claim reporting system, developed by Aetna Benefits Consulting.

The claim reporting program will be leased to Aetna clients to assist with the tracking and analysis of health care and claims costs.

Another DEC customer, Dave Austin, software services manager at Arkwright Insurance in Waltham, Mass., said his company is "kicking around" the idea of purchasing a 3100 system.

"We have a couple of sites where we might use the 3100s as file servers, but it's real early in the ball game," Austin said. "We're looking at the new 3100s as file servers for relational database applications. The price/performance offerings look real attractive."

With the new systems announcement, DEC released VMS Posix Version 1.0. This will allow software developers to write a single application capable of running VMS, Unix and other operating systems, with modification.

VMS Posix Version 1.0 shipments are scheduled to begin Feb. 28. All VAX/VMS system users with VMS operating system software Version 5.5 or higher can use VMS Posix software. Media and documentation kits range in price from $165 to $340.

All of the 3100 models are currently available, and list pricing includes disk and tape.

SAS rolls out new tools

CONTINUED FROM PAGE 69

available for beta testing later in the quarter. A first-year license costs between $4,125 and $28,600 for IBM mainframes and between $2,310 and $15,590 for DEC VAXs.

SAS unveiled three products geared to make SAS more novice-accessible. SAS/Lab is for scientists and engineers who want to use sophisticated statistical methods but who are not statistics experts. It prompts and guides users into making appropriate choices of statistical methods.

SAS/Insight is an interactive tool for graphical data analysis that was previously available for Unix workstations. SAS/English is a natural-language interface that employs a user-updateable knowledge base for querying and reporting data from external sources and SAS data sets.

SAS also introduced SAS/Toolkit, which enables users to write extensions to the SAS system to create their own SAS procedures, functions and interfaces to custom databases using C, Fortran, PL/1 or IBM assembly language.

SAS has begun shipping SAS/PH-Clinical, the first of several products for vertical markets. It is tailored to the clinical-test data analysis and reporting needs of pharmaceutical companies [CW, Dec. 16].

Release 6.07 is the second following a five-year conversion of SAS products from PL/1 and assembler to C, and it smooths out the rough edges that resulted from that conversion, users said. "It's a very stable product," said 6.07 beta-test user Vernon Ross, a computer specialist at the National Science Foundation (NSF). "It's more stable than 6.06, and that's unusual for a beta release."

Still, Ross said he was unhappy SAS had not granted a long-standing request to expand from 8 bytes to 32 bytes the length of names for SAS tables and columns so they could match comparable names in DB2. Not only does the incompatibility force the NSF to set up "mapping" tables to relate SAS names to DB2 names, but it is also confusing and wastes disk space, he said.

A spokeswoman said SAS is aware of the problem and is working on it.

SAS Release 6.07 highlights

Enhancements to existing products:

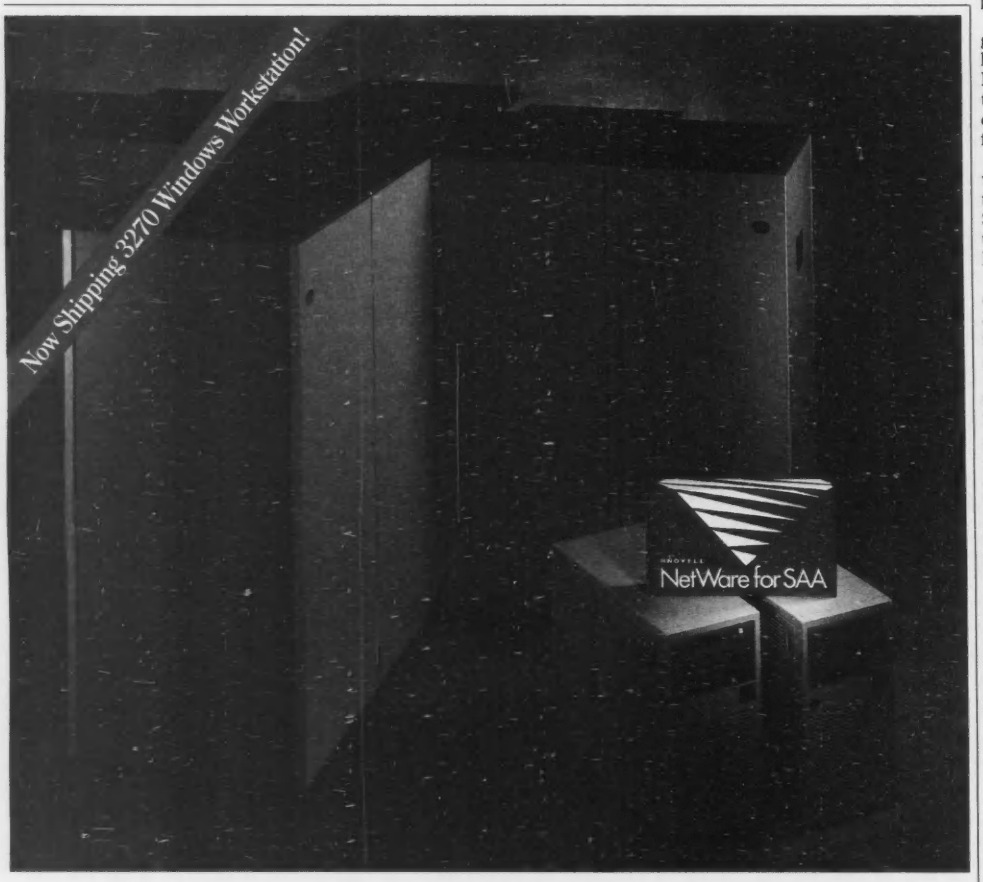
- Improved I/O performance.
- Support for IBM's ESA.
- Support for SQL.
- Support for APPC/LU6.2, TCP/IP and Decnet.

New products shipping now:

- SAS/Calc, an electronic spreadsheet package.
- SAS/Access interface to Ingres, an access to Ingres databases under VMS.
- SAS/Insight, an interactive tool for graphic data analysis.
- SAS/PH-Clinical, for analysis of clinical trials test data.

New products to ship later this year:

- SAS/EIS, for developing and maintaining executive information systems.
- SAS/Lab, for guided data analysis.
- SAS/English, a natural-language interface to SAS.



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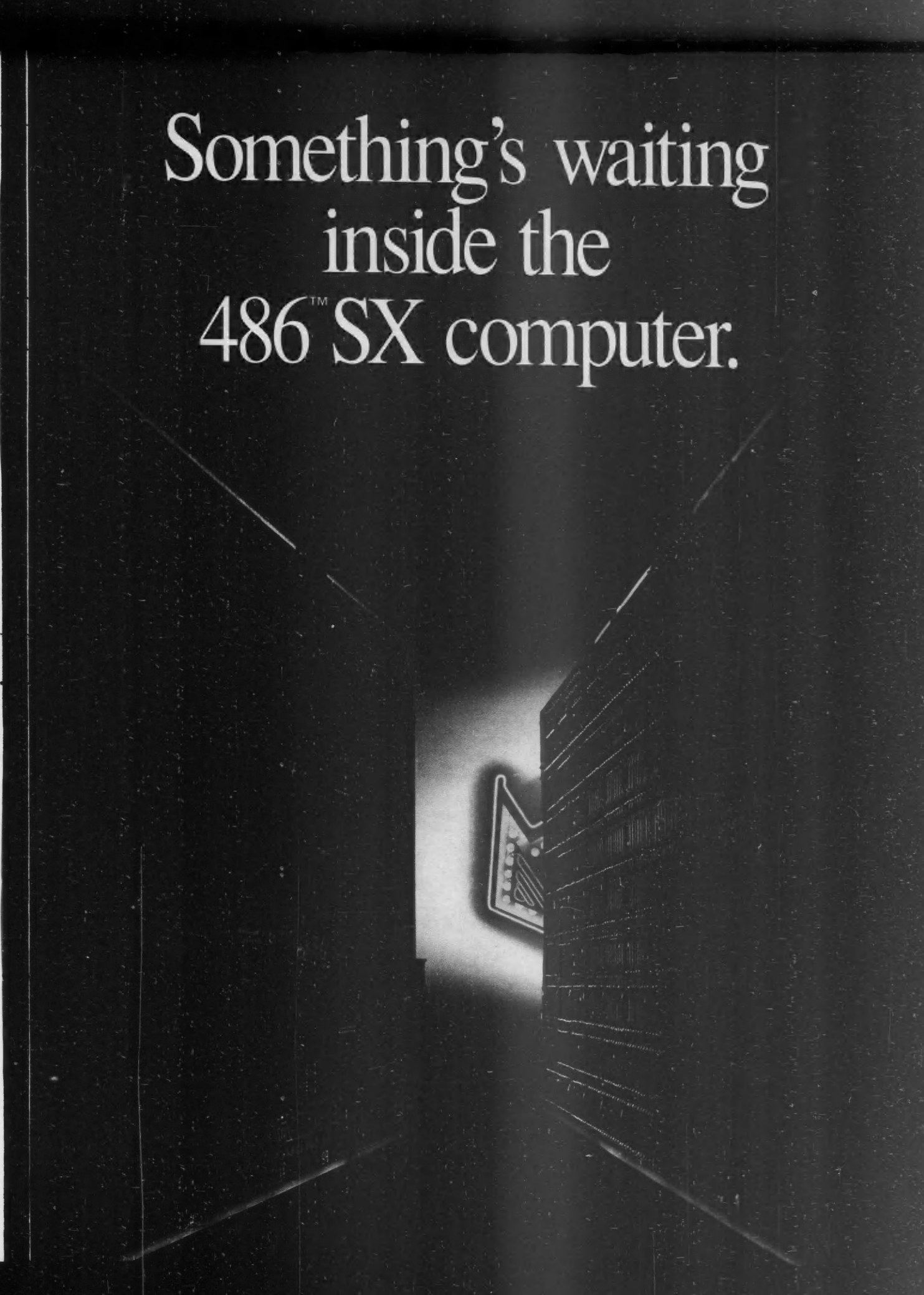
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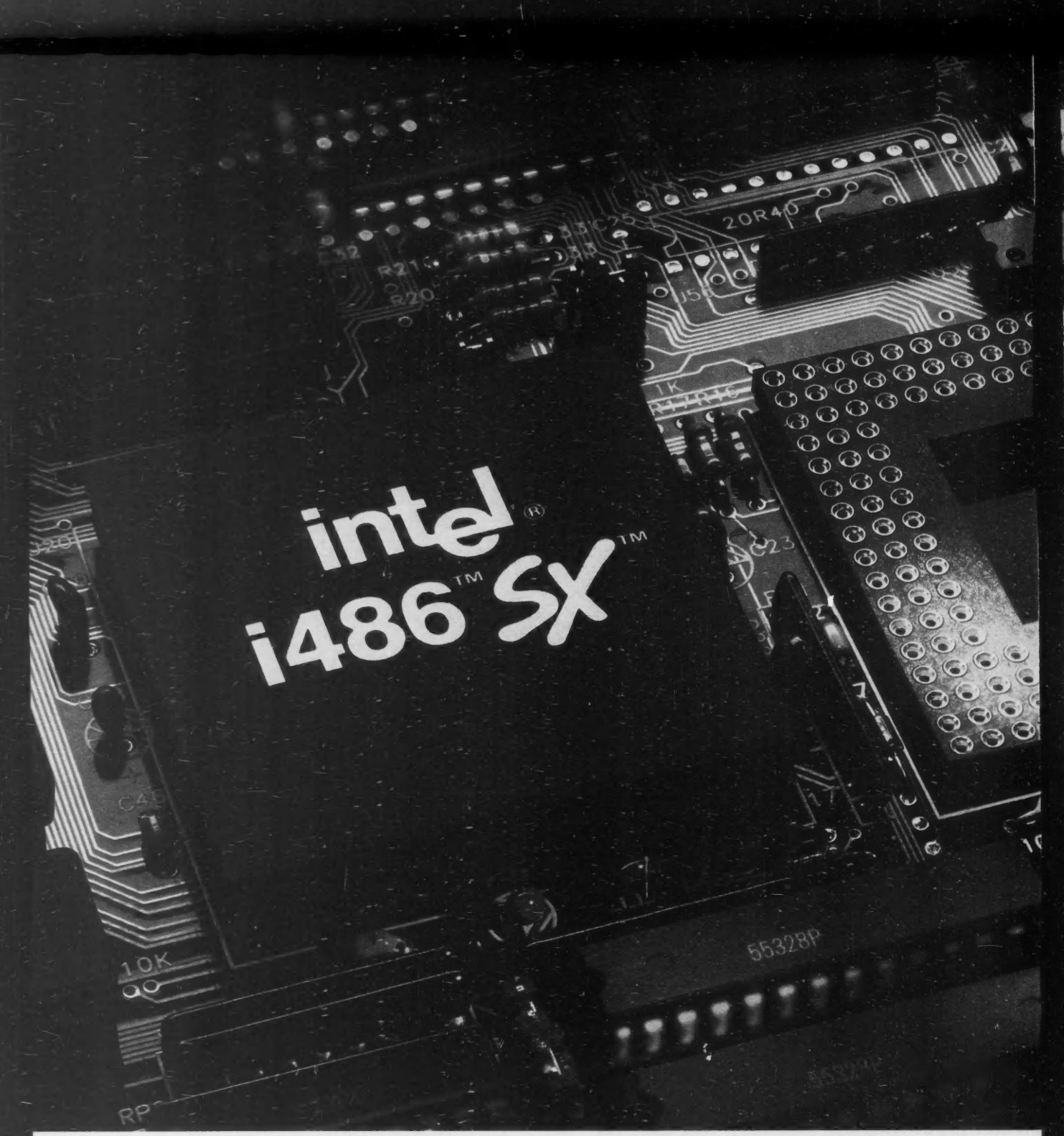
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Mobil tracks environmental laws with software system

BY SALLY CUSACK
CW STAFF

PRINCETON, N.J. — An environmental information software product is helping Mobil Oil Corp. save money while responding quickly and accurately to environmental regulations — on worldwide, federal, state and local government levels.

Bruce A. Larson, manager of safety and health regulations at Mobil's environmental and regulatory affairs department, is responsible for tracking the developing laws and regulations for environmental protection.

Larson said the tremendous volume of regulation by multiple levels of government generated the need for Mobil to investigate a software system to consolidate existing databases and provide up-to-date, on-line information to employees on a worldwide basis.

In 1990, Mobil spent $980 million on environmental expenditures — in areas such as double-hull oil tankers, pollution controls and proper disposal of hazardous waste. Mobil also maintains operations in more than 100 countries, each with its own unique levels and complexities of data. "One of the problems is that all these proposed laws and regulations come out in hard copy form, and trying to keep track of all these publications had us drowning in paper," Larson said.

Since no single source of legislative databases could be found, in 1990, Mobil joined forces with ERM Computer Services in Exton, Pa., and Infodata Systems, Inc. in Falls Church, Va., to create the Earthlaw environmental system.

Earthlaw is a full-text, single-user interface information application for the IBM VM mainframe computing environment that offers fully indexed access to environmental regulations. It contains the full text of current air, health, safety, transportation, waste and water regulations for 25 states and the federal government. Regulations for all 50 states are scheduled to be included within the next two years.

Mobil
Environmental Awareness

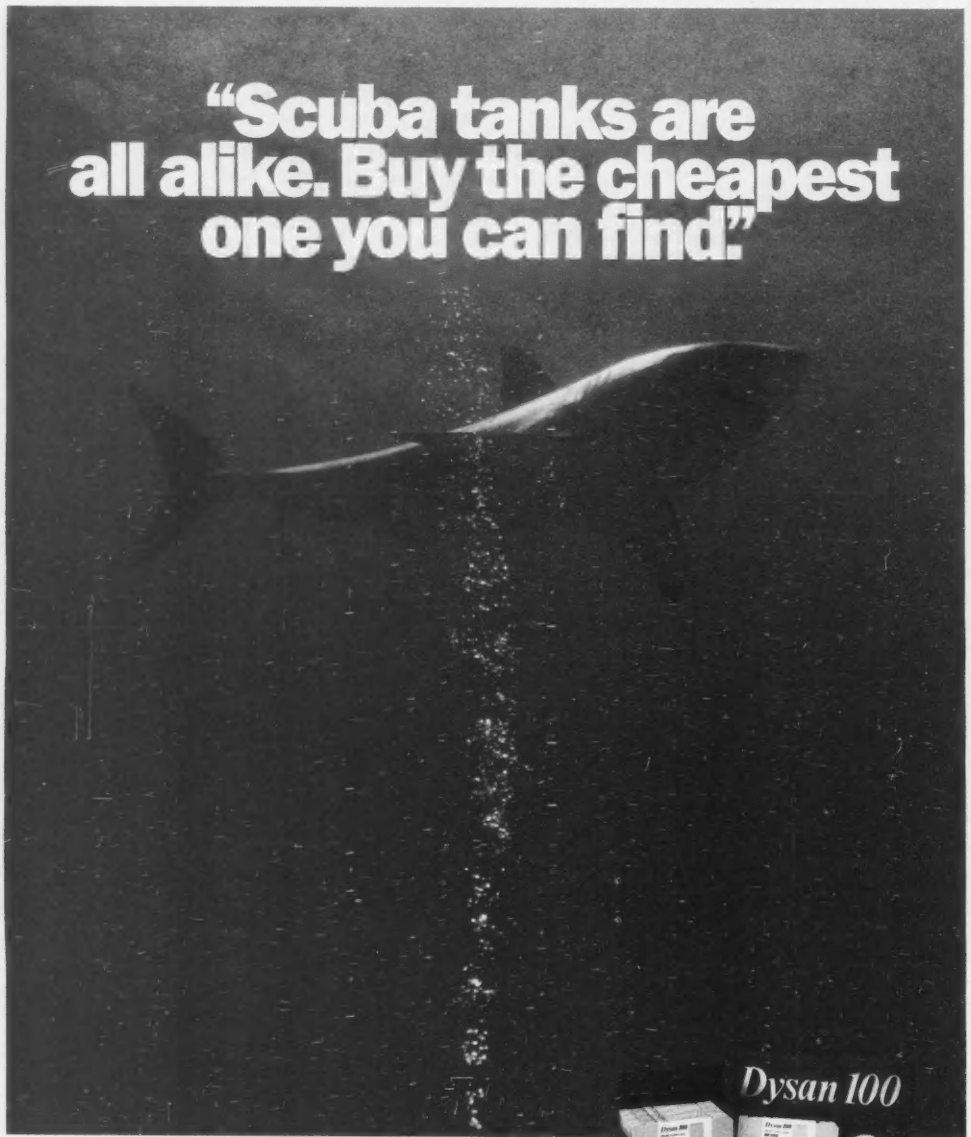
According to Larson, Mobil users now have access to five separate databases of regulatory information via a single user interface through the Earthlaw program.

"We have about 400 users worldwide, and they access Earthlaw via a direct connection to our IBM 3090 in Princeton," Larson said, adding that most end users on the system are utilizing Intel Corp. 80386-based personal computers. This allows them to download text and incorporate the data into spreadsheets or word processing documents.

Before Earthlaw, all 400 users, including engineers, attorneys and lobbyists, had individual subscriptions to the proposed regulatory publications and reports. Larson estimated that it would cost $25,000 per year to give a single person subscriptions to all of the reports and data now available on-line with Earthlaw.

With a four-hour training session, Larson says, most users become adept at searching and selecting data within the system. Regulations may be searched via section or citation numbers, or by date, keyword or phrase.

"Another savings we get is in efficiency," Larson said. "We don't have people calling up looking for data, and nobody is running through large drawers of paper files looking for information."



Goal's tool for disaster recovery

Goal Systems International, Inc. recently announced the second member of its family of disaster-recovery products for the MVS operating system.

Called Sunrise, it is an entry-level package that complements Goal's Arise II. At the same time, Goal released Version 1.2 of Arise II, which includes new and improved interfaces to products from Goal and others, including Computer Associates International, Inc.'s CA-1. Other improvements include performance boosts and support for IBM and Sterling Software, Inc.'s backup programs. Pricing for Arise II ranges from $50,000 to $70,000.

Sunrise is easier to use and implement than Arise II, Goal said. There is a migration facility for Sunrise users to upgrade to Arise II.

Sunrise identifies, tracks and reports on the essential components of critical applications. It also reports on backup availability and generates a tape-pull list so data center employees know which tapes to pull from off-site storage.

Users define which applications are critical to the organization, and Sunrise analyzes the applications and builds a database to back up the applications.

Pricing for Sunrise ranges from $30,000 to $50,000.

Goal relaunches tape manager after adding new functions

Company will also market Mission Critical Software's DSM

BY JOHANNA AMBROSIO
CW STAFF

COLUMBUS, Ohio — Goal Systems International, Inc. has relaunched its Epic/MVS tape management product after pulling it off the market to add more functionality.

Separately, the company, based here, announced an agreement with Houston-based Mission Critical Software, Inc. to market Distributed Storage Manager (DSM). The package, which Mission Critical Software will develop, will help automate some systems management functions for local-area networks connected to mainframes. DSM, which is expected to be ready next year, will help with data backup, moving data to off-site storage and recovery from server and workstation failures.

Epic/MVS, which can be integrated with other Goal tape management software, including Epic/VSE and Epic/CMS, was originally released to beta-test sites in November 1990 and installed by approximately 55 customers in the following 12 months, said Michael J. May, group marketing manager.

During that time, additional customer requirements came to light, including the need to directly connect to Storage Technology Corp.'s 4400 Automated Cartridge System, so Goal pulled the product off the market in April 1991. Epic/MVS was put back into beta testing in late October 1991, with an additional 14 or so early customers.

Epic/MVS works by managing the names of the data sets stored on the tapes; other tape management software, including Computer Associates International, Inc.'s CA-1, is based on volume serial numbers of the tapes.

Conversion ease

To help users convert, Goal provides a utility that copies one format into another as the old system is running, compares the old with the new and eventually helps users decide when to make the final cutover.

Argo-Tech Corp. in Cleveland used that facility when it converted from CA-Dynam/TLMS, a tape library management system from CA, to Epic/MVS. The utility "automates most of the process, but you have to tweak a little," said Tom Miller, manager of computer operations. Argo-Tech has had Epic/MVS installed for about a month and will be putting it into production over the next two or three weeks, Miller said.

May said his company "is not so much out to convert CA or other customers, but if you want an alternative, we now offer one." Primarily, he said, "Epic/MVS rounds out our automated systems operations product line so we can now offer a complete tape management solution."

Epic/MVS also features a vault management system that controls the movement of tapes to and from off-site storage locations. Prices for Epic/MVS range from $23,800 to $66,600.

Must debuts Nomad tool

Must Software International recently introduced a data-access tool for users of its Nomad fourth-generation language.

The package, called Nomad Access, automates the transfer of mainframe data to personal computer software. The software connects the PC to the mainframe, retrieves requested data from mainframe databases, formats the data for a variety of PC products and transfers the data to the PC.

Nomad Access requires Nomad running on both the PC and the mainframe. The access product has two components: one for the workstation and another for the host that runs under either MVS or VM. Supported mainframe databases include IBM's DB2, SQL/DS, IMS, QSAM and VSAM as well as Computer Associates International, Inc.'s IDMS.

Formats for 1-2-3

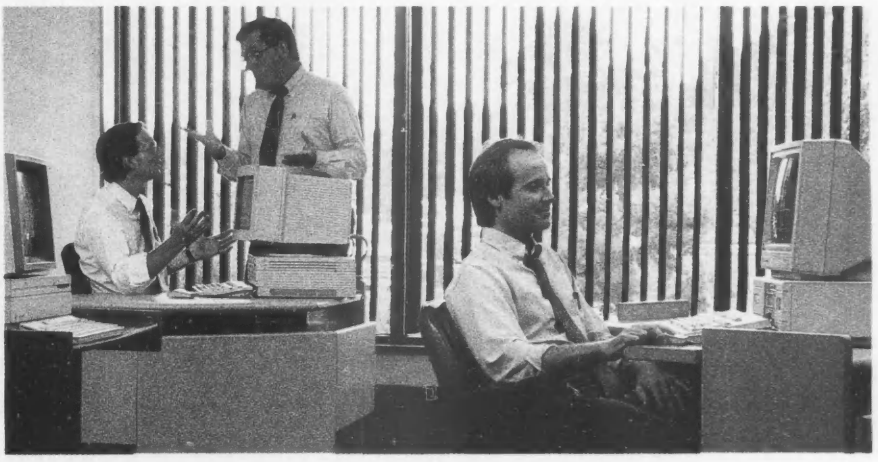
On the PC side, Nomad Access formats data for Lotus Development Corp.'s 1-2-3 and Microsoft Corp.'s Excel, as well as ASCII and other formats. Nomad Access allows users to select and summarize data for a specific request rather than transferring whole files or tables from the mainframe. It also verifies that the size of the file being sent does not exceed the amount of available PC disk space.

The PC portion includes a menu bar and pull-down and pop-up windows to guide users through host connection, request generation and data transfer.

Nomad Access requires Nomad Version 5.04 or higher on mainframe and Version 3.1 on PC-DOS. Pricing ranges from $2,400 to $18,000, depending on the machine's size. It is available now.

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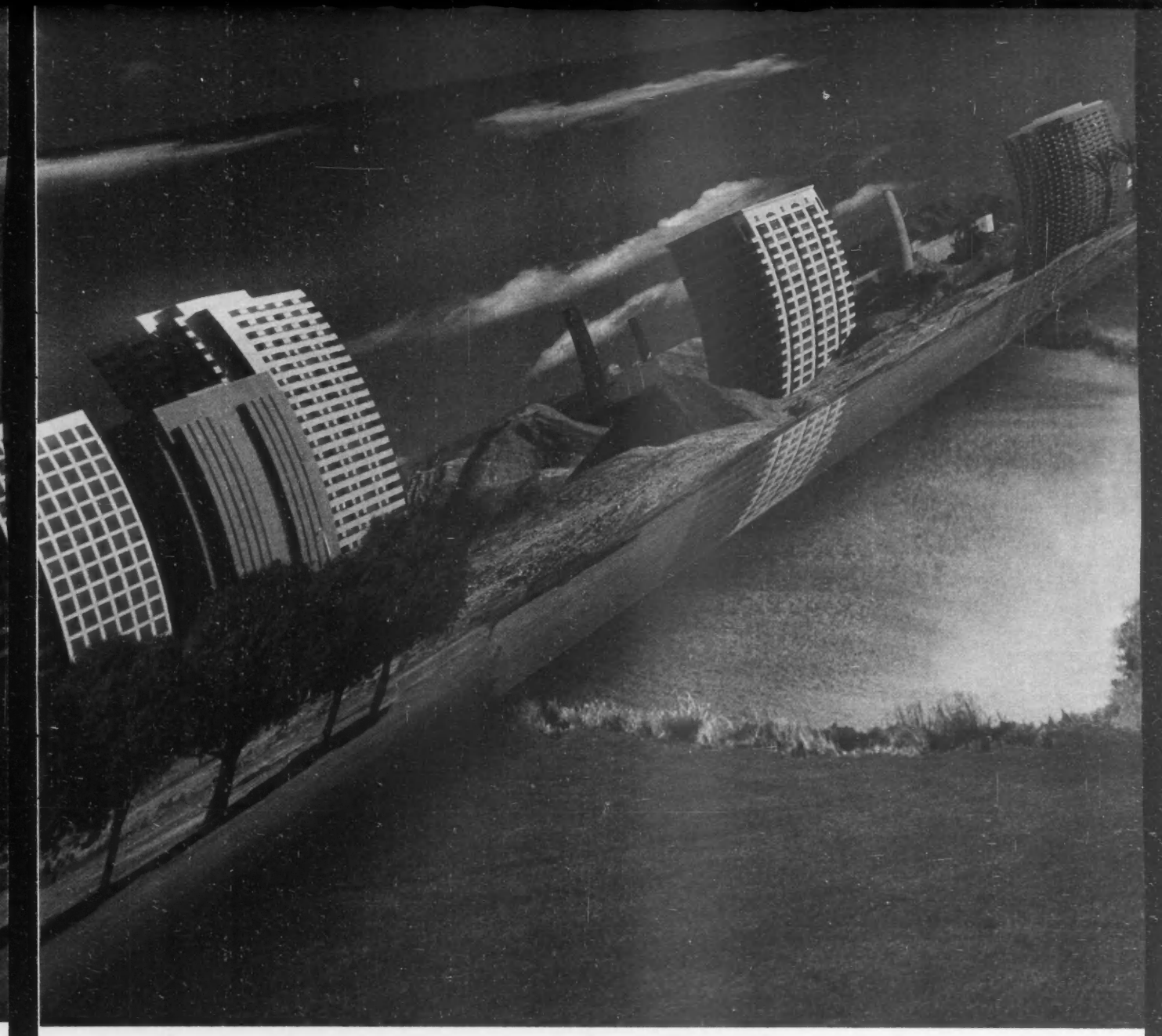
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NEW PRODUCTS — SOFTWARE

Unix software

Teamone Systems, Inc. has upgraded its Teamnet concurrent engineering environment for distributed configuration management.

Teamnet runs under Unix and provides configuration and data management for software as well as electronic and mechanical engineering projects.

Release 3.0 of the product offers a new X Window System graphical interface as well as improved process control and conflict resolution mechanisms for concurrent development. Network support has also been enhanced.

Teamnet 3.0 costs $3,000 per license in networked environments, with each license supporting two concurrent users.

Teamone Systems
710 Lakeway Drive
Sunnyvale, Calif. 94086
(408) 730-3500

Utilities

Pinnacle Software, Inc. has announced DBG, a tool for automating debugging processes on the IBM Application System/400.

DBG allows users to use a single DBG command rather than several commands. It provides a memory map during execution to display debugging processes.

The software costs $275 per central processor.

Pinnacle Software
4530 S.E. 59th St.
Portland, Ore. 97206
(503) 229-3319

Avalanche Development Co. has released Proof Positive, a set of proofreading software tools for use with Interleaf, Inc.'s Interleaf 5 Publishing System.

The product checks Interleaf documents for spelling, grammar, style and readability. The spell checker allows unlimited user-defined entries. Proof Positive also includes on-line versions of the American Heritage Dictionary and Roget's Thesaurus.

The software runs on Digital Equipment Corp. VAX systems and a variety of Unix workstations. Pricing for a single-user license starts at $695.

Avalanche Development Co.
947 Walnut St.
Boulder, Colo. 80302
(303) 449-5032

Applications packages

Dun & Bradstreet Software has developed Inventory Control, a real-time inventory software package.

The software tracks inventory and automatically calculates necessary reorder quantities for each location of a business. It is integrated with D&B Software's Purchase Order and Accounts Payable modules.

Inventory Control runs on Digital Equipment Corp. VAX system. Pricing starts at $36,000.

D&B Software
550 Cochituate Road
Framingham, Mass. 01701
(508) 370-5000

Systemetrics, Inc. has devised an audio software tool kit for Digital Equipment Corp. Vaxstation 4000 desktop systems.

Audiotoolkit for VMS provides software support for digitizing, recording and playback of audio data from sources including microphones, telephone handsets and compact disc players.

A graphical keyboard can be displayed on-screen for composing simple tone sequences.

The product costs $475 per workstation.

Systemetrics
120 Appleton St.
Cambridge, Mass. 02138
(617) 868-8308

Softstar Systems has announced Version 3 of Costar, a software project cost estimation system for Digital Equipment Corp. VAX platforms.

Costar automates estimation processes and generates a recommended schedule with cost and staffing requirements. New features include support for function points, new cost drivers and the Ada Constructive Cost Model of project estimation. The documentation has also been rewritten to include new tutorials.

Pricing has been lowered to $800 for a single-user version. Costar can also run on a personal computer.

Softstar Systems
28 Ponemah Road
Amherst, N.H. 03031
(603) 672-0987

HARDWARE

Data storage

Maynard Electronics, Inc. has started shipping Python, a digital audio tape drive with data compression capability.

The Python drive stores up to 8G bytes of data on a single 4M-byte 4mm tape cartridge. Effective data transfer rate for the drive is 732K byte/sec. The drive has high-speed random file access averaging 30 sec. on a 90-meter tape. Internal and external models are available.

Pricing ranges from $2,250 to $2,750.

Maynard Electronics
36 Skyline Drive
Lake Mary, Fla. 32746
(407) 263-3500

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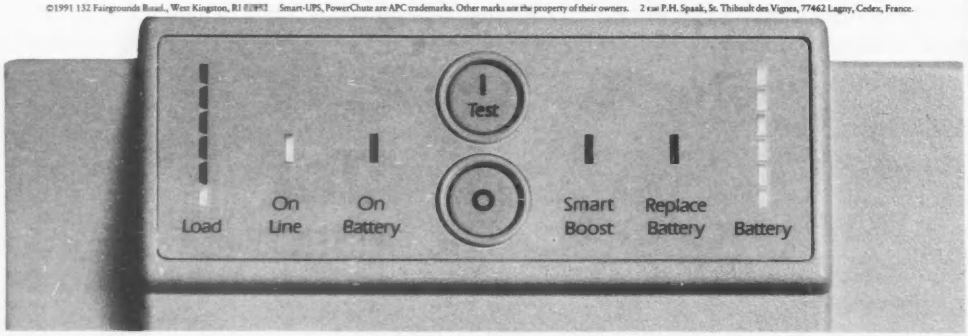


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E-mail software

LAN-based packages are selling fast, and they're being used for a lot more than just interpersonal messaging

BY NINA BURNS

If you're in the market for a local-area network-based electronic-mail system, you've got lots of company. At last count, there were 5 million people using LAN-based E-mail, and at the current growth rate of 70%, that number is expected to reach over 50 million in 1995. By 1993, personal computer LAN electronic mailboxes are expected to outnumber all host and public E-mail service mailboxes (see chart page 84).

However, their overwhelming popularity doesn't make a selection any easier. Most companies purchasing these systems have more than mere messaging in mind. LAN-based systems are being interconnected with host E-mail and public E-mail services to create extensive E-mail infrastructures.

These complex systems are used not only for informal messages sent from user to user but also for building applications that generate messages themselves, called mail-enabled applications (see story page 84); for all internal corporate communications; and for interactions with business partners and customers outside of the company.

All this makes choosing a PC LAN E-mail system more difficult than just selecting features your end users will like (see story page 88). You also need to consider the system's scalability and manageability and the ease with which it can be integrated with other E-mail systems.

The leaders in the LAN E-mail market — which includes the CC:Mail division of Lotus Development Corp., Microsoft Corp., Novell, Inc. and a number of independent Netware Message Handling System (MHS) vendors such as Beyond, Inc., Da Vinci Systems, Futurus Corp., Notework Corp. and Reach Software Corp. — have just begun to meet these more complex criteria by starting to develop published application programming interfaces (API), supporting multiple transport systems and providing directory services and management tools.

Burns is president of Network Marketing Solutions in Menlo Park, Calif., a consulting firm specializing in LAN and electronic messaging. She is also cofounder of Messaging Solutions in Palo Alto, Calif., which specializes in technology and product seminars.

SUPPORTING ROLES

Although the number of LAN-based E-mail installations is expected to overtake host-based and public E-mail services by 1993, there are still important roles for the older platforms.

Host-based systems will serve as a platform for message switching, directory integration and sophisticated administrative services.

Public E-mail services will provide an attractive alternative for low-risk connectivity to X.400 environments, administrative and billing services, message switching and wide-area connectivity.

Bring on the apps

You've probably noticed the attention being paid to "open APIs" these days. The emerging category of mail-enabled applications is what's causing all the fuss.

For a programmer (either in-house or commercial) to develop an application that can send a message to another application or to a user, he needs to write to an interface, or API, that links the application to an underlying messaging system (see story page 85).



Dave Calver

Although Netware MHS Simple Mail Format (SMF) API has become something of a de facto standard, what users really need is one standard API that a large number of applications and systems vendors support.

And vendors are starting to respond to that need. Until recently, Novell, Microsoft and Lotus were all working separately on publishing APIs. Microsoft's Messaging API (MAPI), part of the company's Windows 4 Service architecture, is expected to be released in the next two years. Lotus released the technical specification for its Open Messaging Interface (OMI) and garnered support from IBM and Apple Computer, Inc. but not Novell and Borland International, Inc.

Then, just last week, Apple, Borland, Lotus and Novell announced a single API, called the Vendor-Independent Messaging (VIM) interface.

VIM supercedes OMI and Novell's SMF (but not MHS as a transport). The interface will be

Continued on page 84

INSIDE

True Cost of E-mail
Hidden costs include unproductive messaging. Page 84.

Product Guide
A comprehensive list of LAN-based E-mail packages. Page 89.

Not Just For Messaging
Bulletin boards, user exits, forms generation and more. Page 92.

More than just messaging

CONTINUED FROM PAGE 83

free of charge, released to the public domain and fully supported by the above-mentioned players. Such support is expected to eliminate a lot of the confusion surrounding APIs and allow the next generation of applications to be developed because it eliminates the need for developers to support multiple APIs.

Development will also be quicker and less costly because there's no need to write to the underlying operating system. It also frees users from becoming dependent on one vendor, since it is supported by both the application vendors and the back-end message system vendors.

It's not clear yet which application and system vendors other than Microsoft will choose to develop to MAPI, although if you are committed to Microsoft's Windows, that interface makes sense. We will likely see many new applications based on Microsoft's Windows 4 architecture in two to three years.

Arriving with transport systems

Beyond APIs, PC LAN E-mail vendors must also support other vendors' transport systems if their messaging systems are to become truly integrated.

Non-PC LAN transports include IBM's Systems Network Architecture Distribution Services, Digital Equipment Corp.'s All-In-1 and the Simple Mail Transport Protocol (SMTP) used by the Internet. The only formal standard transport is X.400, although Netware MHS is widely used by PC LAN E-mail systems either natively or through gateways.

There are four ways to support all of these environments: point-to-point gateways, an X.400 backbone, public mail services and the sophisticated gateway capabilities of Softswitch, Inc.

If you have only a few (less than four) environments, point-to-point gateways can work very well. They are relatively inexpensive to implement and generally require low maintenance.

Most of the PC LAN E-mail vendors provide gateways from their proprietary systems to MHS, IBM's Professional Office System, SMTP and public E-mail services. Third-party vendors also provide gateways between PC LANs and other E-mail environments.

If you have numerous E-mail systems to integrate and you want to communicate between company sites and with trading partners, an X.400 backbone makes sense. X.400 also works well if you have significant international traffic or are planning to migrate to Open Systems Interconnect.

Public E-mail service providers are starting to supply PC LAN E-mail gateways, taking on any related administration, maintenance and support. GTE Corp.'s Sprintmail is the first to offer such a service, both for X.400 and for CC:Mail.

Public services can be costly, ranging from 30 cents to $1 per average message, plus registration fees. Keep in mind, however, that they save in administration, maintenance and support costs, have low start-up costs and are widely accessible from anywhere in the world.

Softswitch's Softswitch Central is in a category all its own, providing not only gateways but also the most extensive message management facilities available.

Gateways will become less necessary when Novell, Microsoft and Lotus deliver on their promises to support multiple transport systems. Expect to see Novell deliver support for SNADS, MHS, X.400 and SMTP in the first release of its Netware Messaging Architecture, due out in mid-1992. The concept is similar to Softswitch but runs on a Netware 386 server rather than on an IBM mainframe.

Directory integration headaches

E-mail directories contain the necessary addressing and routing information required to reach every user on the E-mail system. Since every E-mail system has a proprietary directory, integrating the naming and address information across different directories is a major issue.

The ideal is to be able to make changes in only one place and rely on the system to automatically propagate those changes throughout the network.

Most PC LAN E-mail systems provide basic propagation utilities for their own environments but exhibit problems in large, heterogeneous environments. For instance, costs can be high; there is an inherent lack of interoperability and synchronization between proprietary packages; there are few administrative tools; and performance is poor.

Just the same, CC:Mail's Automatic Directory Exchange allows administrators to select user names to be propagated between post offices and determine which post offices will exchange directories. Microsoft's Mail for PC Networks includes a utility for the administrator to export the directory or a subset to other Microsoft post offices, but the process is not automatic. Da Vinci Systems' Names Services automatically propagates directories between Netware MHS hosts and can be used by any MHS application.

Softswitch Directory Synchronization constructs a central repository for directory entries, and changes, additions and deletions are sent via an E-mail message to the names directory. The directory is updated and propagated back to the E-mail systems.

Because of the problems with directory propogation, many large users find it more efficient to write their own programs for integrating directories and automating directory propagation.

Managing the system

The more users and E-mail systems you are supporting, the more you need administration and management tools to maintain the E-mail server, monitor traffic and issue reports.

The most basic tools should perform the following types of functions:

- Reclaim disk space from deleted messages.
- Notify administrators of undelivered messages with error messages indicating why they weren't delivered.
- Compress files.
- Notify the administrator of error or threshold conditions via alarms.
- Monitor the network mail, including reporting on message flow.

Most PC LAN E-mail systems provide tools for managing their own environment as well as minimum statistics on message flow.

Softswitch offers Mail Monitor, which detects and reports failures of E-mail network components such as gateways, Softswitch Central, E-mail systems and mail-enabled applications. Mail Monitor also monitors the level of service by measuring the time it takes for mail to flow through the network.

More of this kind of capability is needed from the PC LAN vendors. Without them, PC LAN E-mail administrators are in a reactive, troubleshooting mode, relying on users to tell them when a gateway or E-mail failure occurs.

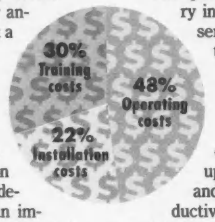
Keep in mind that PC LAN E-mail products are just beginning to address the needs of large, integrated E-mail systems. Open APIs and support for multiple transport systems will be first. Directory services and sophisticated management tools and services will follow in the next couple of years.

It's important to evaluate the various strategies, timetables and current solutions before making a decision on an E-mail system that will stay with you for years to come. •

The real deal

It costs about $4 per user per day to install, operate and support a LAN-based E-mail system. Even though that quickly tallies to $1,000 per user annually, you can consider it a bargain.

That's because E-mail significantly reduces your phone bill and the cost of overnight and regular postage charges, not to mention secretarial costs. The degree to which E-mail can improve corporate communications makes it worth its price.



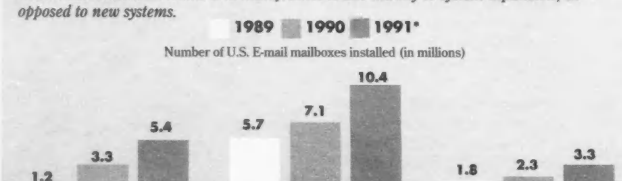
How is the $1,000 per year allocated? Approximately $200 goes to hardware and software installation, with the remaining $800 spent on training and operations. The latter category includes support, gateway services and communications costs.

And don't forget the hidden costs. About $300 of the $800 spent on training and operations can be chalked up to routine self-learning and support — and unproductive time that users spend gossiping or exchanging jokes on the E-mail system.

NINA BURNS

E-mail choices

Electronic mailboxes on PC LANs are increasing as quickly as on all other platforms combined. Growth on minis and mainframes is due mainly to system expansion, as opposed to new systems.



Source: "Electronic Mail & Microsystems"

Three ways to get the mail

Mail-enabled applications fall into three categories:

- Applications that enhance the functionality of the E-mail system, such as calendaring and scheduling, mail management, document translation and enhanced security.

- PC applications that send and receive E-mail messages from within the application. Examples include Microsoft's Word and Excel, Borland/Ashton-Tate Corp.'s Framework and Lotus 1-2-3 using Beyond's @Mail.

- Applications that depend on the E-mail system for application-to-application and application-to-user communications.

For instance, in a purchase order processing application, the user can fill out a purchase order request form on his PC. When the form is completely filled in, it is automatically submitted through the E-mail system to the appropriate manager for a signature. The manager receives the request in his E-mail box, and the purchase order form is displayed on his PC when the message is opened. If he approves the purchase, the form is then automatically routed to the accounting department for processing. If it is denied, notification is automatically sent back to the user.

For example, Reach Software uses the underlying Banyan Systems, Inc. Vines Mail or Novell Netware MHS to route forms in its Workman work-flow applications. Forms are routed through the E-mail system as attachments.

Other examples of mail-enabled applications include report distribution, sales order processing and loan processing.

NINA BURNS

Putting together pieces of the E-mail puzzle

BY NINA BURNS

In the interest of supporting mail-enabled applications, PC LAN-based E-mail vendors are starting to modify the composition of E-mail messages.

A traditional E-mail system is composed of four proprietary parts:

- The user agent, which allows the user to create, send, receive, manage and administer messages. This is also called the "client application."
- The message store, which provides user mailboxes and stores messages in a database or file system.
- The directory, which lists the names of all the mailboxes in the system and typically contains other information about users, such as title and organization.
- The transport system, which passes messages from sender to recipient either directly or through intermediate gateways or E-mail servers to remote users.

The user agent is often called the "front end." The message store, directory services and transport services are collectively called the "back-end services."

What vendors are starting to do is supply interfaces (also called application programming interfaces, or APIs) to separate the client application from the back-end services. By doing so, they let any number of applications use those services to send and receive messages.

But before programmers can write applications to the interfaces, the vendors need to publish the APIs. Novell was the first to do this with its Simple Mail Format (SMF) API.

Just last week, Lotus, Novell, Apple, Borland and IBM formed a consortium to announce the Vendor-Independent Messaging (VIM) API, and Microsoft is currently working to publish its Messaging API interface (see story page 83). There is also an X.400 equivalent — XAPI — that is published by the X.400 API Association.

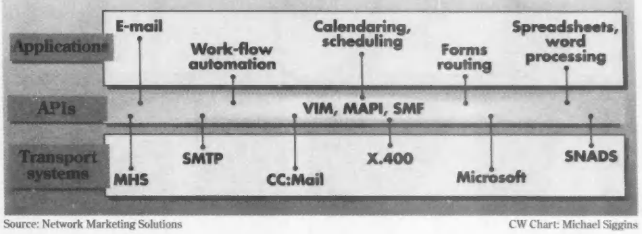
There are several advantages to this structure. First, third-party vendors don't need to be experts in messaging to develop mail-enabled applications.

Second, if the underlying message system is changed, there is no need to change the application and vice versa. For example, if an application uses the VIM interface, the underlying messaging system could be from any vendor that supports VIM. Theoretically, if you write applications using VIM to interface with a Lotus back end and then want to switch to an IBM, Novell or Apple messaging system, your applications will not have to change.

Third, applications can interoperate because they use the same format for messages. A message that uses Novell's SMF can be read and understood by any application that also uses SMF. For example, if you send a Da Vinci Systems E-mail note to a Beyond mail server, you can read that note in Beyond's @Mail because both applications use SMF.

Portrait of an E-mail message

Messages are divided into three parts: the client application, a link to the transport system (the API) and the transport system itself



Source: Network Marketing Solutions

CW Chart: Michael Siggins

Is that E-mail?

You don't need to buy an E-mail package to get messaging capabilities.

The ability to transfer messages and files is found in all kinds of products, from secretarial consoles to supercomputers.

Virtually every copy of the Unix operating system contains a basic E-mail utility, as do products based on Transmission Control Protocol/Internet Protocol.

A plethora of enhanced fax, videotext and audiotext vendors are also crossing over into the E-mail market. Alcom, Inc. in Palo Alto, Calif., sells LAN Fax Redirector, which processes inbound faxes and routes them on a Netware MHS E-mail transport system.

Even beeper/pager makers are joining the crowd. Major paging companies Skytel Corp., Motorola, Inc., RAM Broadcasting Corp. and Bellsouth Corp. are now at the vanguard of the movement toward wireless E-mail and all recently completed major alliances with E-mail vendors.

ERIC ARNUM

Looking beyond the 'big guys' in host-based systems market

BY ERIC ARNUM

Host-based E-mail vendors can be divided into two parties: the Big Guys and the Other Guys.

The Big Guys are DEC, IBM, Wang Laboratories, Inc., Data General Corp., Hewlett-Packard Co. and Unisys Corp. These six claim 82% of the 10.35 million electronic mailboxes on hosts and about 45% of all types of E-mail, including LANs and public E-mail services.

DEC and IBM lead the pack, claiming 6 million and 5 million mailboxes, respectively. Each has created such a high level of awareness for its flagship product — DEC's All-In-1 and IBM's Professional Office System (Profs) — that users may think they're the only game in town.

The second tier

But there are alternatives, most of them sold by small, independent companies that claim about 2.3 million end users. The Top 5 Other Guys (see chart at right) tend to come under rather harsh judgment because of the criticism IBM's own E-mail products have encountered.

IBM's Profs has always been pegged as a resource hog, expensive and hard to use. Its successor, Officevision, hasn't fared much better because it's been late to market.

The alternative products do deserve a closer look, however. Verimation, Inc.'s Memo, for instance, is estimated to cost only $10 per user per month, as opposed to Profs' $150 per user per month fee, according to Gartner Group, Inc., a market research firm in Stamford, Conn.

Computer Associates International, Inc. has put its CA-Email+ at the core of a newly integrated lineup of its office automation products. It provides interfaces to other vendors' applications.

H&W Computer Systems, Inc. not only offers an E-mail package for IBM CICS installations but also sells E-mail links to the IBM Profs and Distributed Office Support System environments, as well as to telex, Bitnet and several other E-mail services.

NBS Systems, Inc.'s E-mail package was designed to expand from as few as 100 users to as many as 10,000. The alternatives to Wang, Unisys, DG, HP and DEC E-mail products are even less well-known than the IBM alternatives.

Still, it's quite apparent that the era of host-based E-mail is giving way to LAN-based E-mail. Many of these vendors — including Verimation, NBS Systems and Fischer International Systems Corp. — have announced LAN E-mail packages recently. H&W Systems added a LAN link from its mainframe package to any existing Novell Netware MHS E-mail application. DEC, Wang and IBM are also creating LAN versions.

Their hope is to position the host as the ideal E-mail server in the LAN era (see story page 83) or, if all else fails, at least to keep some accounts active as customers move from host to LAN.

Arnum is the editor of "Electronic Mail & Micro Systems," a twice-monthly newsletter published in New Canaan, Conn.

Host-based E-mail

There's more to this group than the 'big guys' — IBM, DEC, Wang, Data General, HP and Unisys

	Compatible operating system
Computer Associates International, Inc.'s **CA-Email+** *Garden City, N.J.*	IBM VM, CICS
Fischer International Systems Corp.'s **EMC²/TAO** *Naples, Fla.*	IBM VM, MVS
H&W Systems, Inc.'s **SYSM** *Boise, Idaho*	IBM CICS
NBS Systems, Inc.'s **Toss** *Enfield, Conn.*	IBM CICS
Verimation, Inc.'s **Memo** *Rockleigh, N.J.*	IBM VTAM
Walker Richer & Quinn, Inc.'s **Posthaste** *Seattle*	HP 3000
Infocentre Ltd.'s **Speedmail** *Boise, Idaho*	HP 3000
Cableshare, Inc.'s **Mercury 2000** *London, Ontario*	DEC VAX
Rioux Engineering, Inc.'s **REI-MSG** *Austin, Texas*	DEC VAX
Maxcom USA, Inc.'s **Comet/11** *Waltham, Mass.*	DEC PDP-11
Horizon Data Systems, Inc.'s **Quick-Mail** *Richmond, Va.*	DEC PDP-11
Oracle Corp.'s **Oracle-Mail** *Redwood Shores, Calif.*	IBM VM, MVS
Formula Consultants, Inc.'s **MMS-1100** *Anaheim, Calif.*	Unisys
Magenta Systems USA, Inc.'s **Mail Manager** *Matawan, N.J.*	Wang

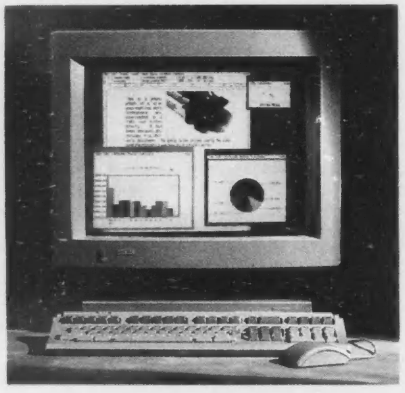
Source: "Electronic Mail & Micro Systems"

CW Chart: Marie Haines

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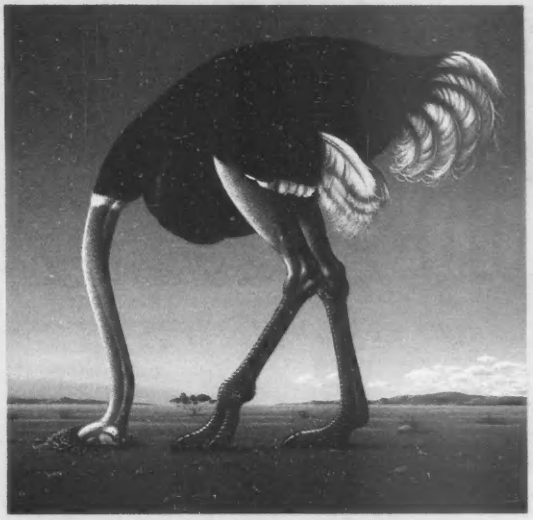


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open another one. And they don't have to interrupt their work to go to another terminal, or start up another application.

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User features range from basic to luxury models

Purchase criteria for an E-mail package depend on the size and complexity of your E-mail network.

In a very small network or one in which a single PC LAN E-mail package is deployed throughout the company, important user features would include the following:

▶**Message creation, handling and management.**

▶**A basic text editor.** Anything fancier belongs in a separate word processor.

▶**An address book.** This is crucial for saving addresses for later replies.

▶**File folders.** These help you organize incoming and outgoing messages.

▶**Nondelivery receipts** for the peace of mind of knowing whether the mail actually went through.

▶**Context-sensitive Help.** You'll want to know what to do while you're messaging, not after you've read the manual.

In a larger and more complex system, where PC LAN, mainframe and external E-mail systems are integrated into a single network, more sophisticated user features become increasingly important:

▶**Automatic forwarding of messages.**

▶**Integrated calendar and scheduling features.**

▶**Hierarchical file folders.**

▶**Sophisticated search-and-retrieval capabilities.**

▶**Integration with other applications,** such as better word processors.

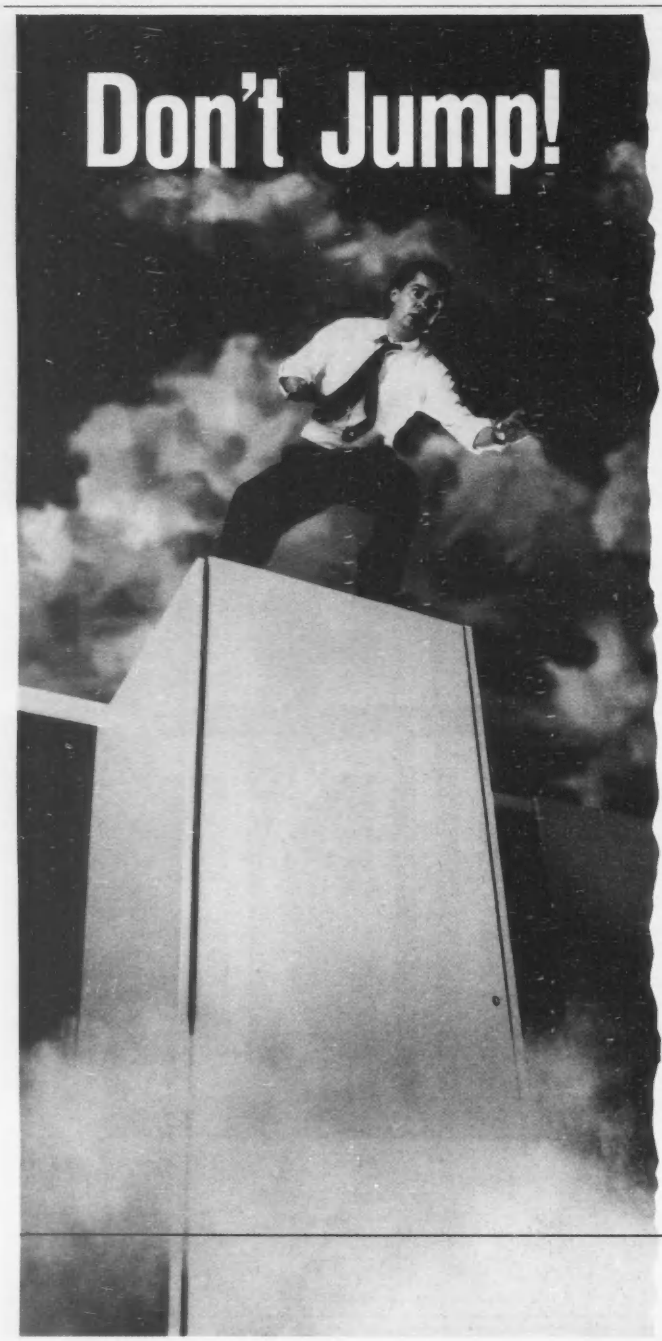
▶**Binary file attachments** to send spreadsheets, database files and so on.

▶**Text-import capabilities.** The crucial point here is to be able to insert other files into the middle of a message.

▶**In-box filtering,** which allows the system to take action on specific messages based on user-defined criteria. For example, a user can forward all messages from a scheduling application for storage in an "appointments pending" folder. Beyond provides the first capabilities of this kind with Beyond Rules.

In highly complex environments, where you are communicating with other company sites and business partners, user features remain sophisticated while IS-related concerns prevail (see chart below).

NINA BURNS and ERIC ARNUM



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Increasing complexity

As the number of users on an E-mail system grows and you move from a workgroup to an enterprise network, the E-mail selection criteria increase

MULTIPLE USERS

- Simple installation, use and administration
- Support for multiple clients (e.g., DOS, Macintosh and Windows)
- Reliability
- Low risk
- Cost-effectiveness
- Log-on security

HUNDREDS OF USERS

- Scalability to hundreds of users
- Integration with non-PC E-mail
- Management tools
- Cost-effectiveness
- Multiple security levels
- Mail-enabled applications
- Sophisticated user features (e.g., autoforwarding, in-box filtering and message search and retrieval)

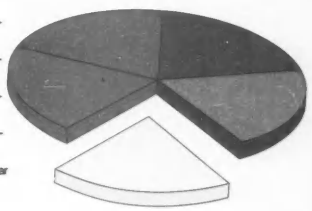
THOUSANDS OF USERS

- Scalability to thousands of users
- Directory integration and propagation
- Support for multiple transports
- Open APIs
- X.400 integration
- Development tools
- Management tools
- Enhanced security
- Cost-effectiveness
- Office application integration

Source: Network Marketing Solutions CW Chart: Marie Haines

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   22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31. Programming Management, Software Developers
   60. Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
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   12. Vice President, Asst. VP
   13. Treasurer, Controller, Financial Officer
   41. Engineering, Scientific, R&D, Tech. Mgt.
   51. Sales & Mktg. Management

   OTHER PROFESSIONALS
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   80. Educator, Journalists, Librarians, Students
   90. Others _____
   (Please specify)

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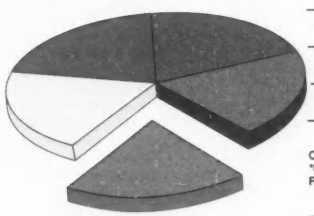
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   70. Mining/Construction/Petroleum/Refining/Agric.
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   85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   90. Computer/Peripheral Dealer/Distr./Retailer
   75. User: Other _____
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   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31. Programming Management, Software Developers
   60. Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
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   12. Vice President, Asst. VP
   13. Treasurer, Controller, Financial Officer
   41. Engineering, Scientific, R&D, Tech. Mgt.
   51. Sales & Mktg. Management

   OTHER PROFESSIONALS
   70. Medical, Legal, Accounting Mgt.
   80. Educator, Journalists, Librarians, Students
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LAN-based E-mail software

VENDOR	PRODUCT	CPU HARDWARE REQUIRED	CLIENT OPERATING SYSTEM SUPPORTED	NETWORK OPERATING SYSTEM SUPPORTED	RAM REQUIRED (BYTES) (SERVER/WORKSTATION)	DISK SPACE REQUIRED (BYTES)	MESSAGING FEATURES	MESSAGE MANAGEMENT	SEARCHES BY	E-MAIL ACCESSIBLE WITHOUT EXITING APPLICATION	DIRECTORY PROPAGATION MANUAL OR AUTOMATIC	DIRECTORY SYNCHRONIZATION	GATEWAYS SUPPORTED	SECURITY FEATURES	AMOUNT OF MEMORY FOR TSR*	OTHER FEATURES	PRICE
AT&T Easylink Services (800) 624-5672	PMX/Star Mail	NCR 3000, AT&T Work Group System, AT&T Star Server, 3B2	DOS 4.0	LAN Manager	NA/640	2M	Form and voice mail capabilities, blind carbon copies, message and address templates, carbon copies, screen capture utility, import/export ASCII	Stores mail in folder, saves copies of all mail sent, automatic forwarding, stores folders on local drive, ability to archive selected messages	Header, text	Yes	Manual	No	SMTP, X.400, Easylink	Password	Less than 200K	Automatic distribution	$995 - $1,995
Banyan Systems, Inc. (508) 898-1000	Vines Network Mail	IBM PCs and compatibles, Macintosh	DOS 5.0, OS/2, Windows 3.0	Vines	270K/NA	None	Blind carbon copies, carbon copies, fax sending/receiving, rules to manage messages, import/export ASCII, automatic directory assistance, hot key addressing, certified mail	Stores mail in folders, saves copies of all mail sent, ability to archive selected messages	No searching capabilities	Yes	Automatic	Yes	SMTP, MHS, X.400	Password, Vines Network Security	NA	Automatic distribution, word processor, view attachments	$995 per server
Beyond, Inc. (617) 621-0095	Beyond Mail 1.1	IBM PCs and compatibles	DOS 3.1 or later	Netware, Vines, IBM PC LAN, 3Com, 3+, LAN Manager	NA/1M	3.5M	Form and voice mail capabilities, blind carbon copies, message and address templates, carbon copies, fax sending/receiving, rules to manage messages, import/export ASCII, automatic launch into any PC application	Stores mail in folders, saves copies of all mail sent, automatic forwarding, stores folders on local drive, searches across all folders for mail, ability to archive selected messages, automatic filtering, automatic creation, custom forms, replying of mail	Header, text, sender, subject, date, key word	No	Automatic	Yes	SNADS, SMTP, X.400	Password, encryption of messages stored on server, encryption across network	1.2K	Context-sensitive Help, automatic distribution	$995 starting price; $495 for five-user expansion pack; $1,695 for 20-user pack; $295 for remote access
Braid, Inc. (203) 869-9400	Braid Messenger	IBM PCs and compatibles	DOS 3.0 or later	Netware, Netware Lite, Vines, IBM PC LAN	2M/640K	3M	Form capabilities, message and address templates, carbon copies, fax sending/receiving, fax rotation, rules to manage messages, import/export ASCII, auto routing messages to users, application program interface option telex, fax, E-mail	Stores mail in folders, saves copies of all mail sent, automatic forwarding, hierarchical folders	Header, sender, subject, date	No	Manual	Yes	MHS	Password, user-defined option and message capabilities	NA	Context-sensitive Help, automatic distribution, print servers	$2,495 starting price
CC:Mail, a division of Lotus (415) 961-8800 (800) 448-2500	CC:Mail Windows Platform Pack Version 1.1	IBM PCs and compatibles, Macintosh, any workstation capable of running Windows	DOS 3.1 or later, OS/2, Windows 3.0	Netware, Netware Lite, Vines, IBM PC LAN, Apple File Protocol	NA/2M	4M	Blind carbon copies, carbon copies, screen capture utility, fax sending/receiving, multiple windows, import/export ASCII	Stores mail in folders, saves copies of all mail sent , stores folders on local drive, ability to archive selected messages	Sender, subject, keyword	Yes	Automatic	Yes	SNADS, SMTP, MHS, X.400, VAX, MCI, EX Linc, UUCP, 3COM, Softswitch	Password, encryption of messages stored on server, encryption across network	NA	Context-sensitive Help, automatic distribution	$495 for package price; $195 for eight-user pack; $595 for 25-user pack; $298 for remote access
CE Software, Inc. (515) 224-1995	Quickmail	IBM PCs and compatibles, Macintosh	DOS 3.1 or later, Mac OS 6.05	Netware, Netware Lite, Vines 5.0, any Apple File Protocol-compatible file server	2.5M/1M	512K	Form and voice mail capabilities, blind carbon copies, carbon copies, fax sending/receiving, multiple windows, confirms receipt, time and date stamped, attach files, message notification	Stores mail in folders, saves copies of all mail sent, automatic forwarding, stores folders on local drive, ability to archive selected messages	Sender, subject, date, priority	Yes	Manual	No	SMTP, MHS, X.400	Password	10K for DOS client only	Context-sensitive Help	$599 for 10 users; $2,499 for 50 users; $4,699 for 100 users
Coker Electronics (415) 573-5515	tPost LAN	IBM PCs and compatibles	DOS 3.0 or later, Windows 3.0	Netware, Netware Lite, Vines, IBM PC LAN	448K/240K	360K	Form capabilities, blind carbon copies, message and address templates, carbon copies, fax sending, imports/exports ASCII, host distribution lists	Stores mail in folders, saves copies of all mail sent, automatic forwarding, ability to archive selected messages, automatic mail by categories	Date, delivery status	No	Manual	No	Fax	Password, call-back delivery for remote access users	NA	Automatic distribution, Help menu, custom program menu, full-screen text editor with word wrap	$495 for five users; $695 for 25 users; $995 for 100 users
Concentric Technologies, Inc. (703) 264-8900 (800) 800-3649	Linkage	IBM PCs and compatibles	All versions of DOS	Netware, Netware Lite, Sun PC-NFS	6M/512K	600K	Blind carbon copies, message and address templates, carbon copies, screen capture utility, fax sending/receiving, fax rotation, import/export ASCII, group messaging, message tracking and threading, automatic routing of received faxes	Stores mail in folders, saves copies of all mail sent, automatic forwarding, ability to archive selected messages	Sender, subject, date	No	Automatic	Yes	SMTP, X.400, Async/remote	Password	5K	Context-sensitive Help, automatic distribution	$89 per user, $189 per user for remote access
Cross Communications Co. (303) 444-7799	Cross + Point	IBM PCs and compatibles	DOS 3.0 and 3.3	Netware, Netware Lite, IBM PC LAN, 3Com, LAN Manager	10K	1.5M	Message and address templates	Stores mail in folders, searches across all folders for mail, ability to archive selected messages, hierarchical folders, undelete, unread mail text, remote access	No searching capabilities	No	None	No	None	Password	5K	Context-sensitive Help, automatic distribution	$395 for package price; $295 for remote access
Da Vinci Systems (919) 881-4320	The Coordinator Version II	IBM PCs and compatibles	DOS 3.3	Netware, IBM PC LAN	640K/512K	2M (client), 1.5M (server)	Blind carbon copies, message and address templates, carbon copies, screen capture utility, fax sending/receiving, rules to manage multiple Windows, import/export ASCII	Saves copies of all mail sent, searches across all folders for mail, ability to archive selected messages, sorts mail by sender, subject and date	Sender, subject, date, keyword, type of message	No	Manual	Yes	SNADS, SMTP, MHS, X.400, fax	Password	NA	Context-sensitive Help	$1,800 for 10 users; $4,500 for 50 users; $7,500 for 100 users; $600 for remote access
Digital Equipment Corp. (603) 884-3370 (800) 344-4825	All-In-1-Mail	IBM PCs and compatibles, Macintosh, VAX	DOS 3.3, Windows 3.0, Unix, Mac OS	Pathworks	NA/420K (DOS), 1.2M (Windows), 3.5 (Macintosh)	1.8M (DOS), 3.5M (Windows), 3.5M (Macintosh)	Form capabilities, message and address templates, carbon copies, screen capture utility, fax sending/receiving, multiple windows, import/export ASCII	Stores mail in folders, saves copies of all mail sent, automatic forwarding, stores folders on local drive, searches across all folders for mail, ability to archive selected messages, hierarchical folders	Header, text, sender, subject, date, various P2 header features	Yes	Automatic	Yes	SNADS, SMTP, MHS, X.400, Wang	Password	NA	Context-sensitive Help, spell checker, automatic distribution	$600 starting price

All products have public and private mailing lists.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

VENDOR	PRODUCT	CPU HARDWARE REQUIRED	CLIENT OPERATING SYSTEM SUPPORTED	NETWORK OPERATING SYSTEM SUPPORTED	RAM REQUIRED (BYTES) (SERVER/WORKSTATION)	DISK SPACE REQUIRED (BYTES)	MESSAGING FEATURES	MESSAGE MANAGEMENT	SEARCHES BY	E-MAIL ACCESSIBLE WITHOUT EXITING APPLICATION	DIRECTORY PROPAGATION MANUAL OR AUTOMATIC	DIRECTORY SYNCHRONIZATION	GATEWAYS SUPPORTED	SECURITY FEATURES	AMOUNT OF MEMORY FOR TSR*	OTHER FEATURES	PRICE
Enable Software (518) 877-8600	Higgins E-Mail	IBM PCs and compatibles	DOS 3.1 or later, OS/2, Windows 3.0	Netware, Netware Lite, Vines	NA/320K	1.8M	Message and address templates, carbon copies, screen capture utility, fax sending/receiving, multiple windows, import/export ASCII	Stores mail in folders, saves copies of all mail sent, automatic forwarding, stores folders on local drive, searches across all folders for mail, ability to archive selected messages, keyword system	Sender, subject, date, keyword	Yes	Automatic	Yes	SNADS, MHS, X.400, MCI Mail, 3+Mail, fax	Password, encryption of message stored on server	3K	Context-sensitive Help	$295 package price; $36 per user; $395 for five-user remote access
Fischer International Systems Corp. (813) 643-1500 (800) 237-4510	EMC²/TAO LAN	IBM PCs and compatibles	DOS 3.3 or later, Windows 3.0	Netware, Netware Lite, Vines, IBM PC LAN	4M/400K	215M (server), 770K (client)	Form capabilities, blind carbon copies, message and address templates, carbon copies, fax sending/receiving, fax rotation, multiple windows, import/export ASCII	Stores mail in folders, saves copies of all mail sent, automatic forwarding, searches across all folders for mail, bulletin boards, conferences	Header, sender, subject, date, keyword	Yes	Automatic	Yes	SNADS, SMTP, MHS, X.400, Profs, Bitnet	Password	NA	Context-sensitive Help, automatic distribution, calendar scheduling	$1,100 starting price; $500 for 100 users; $150 remote access
Futurus Corp. (404) 392-7979	Futurus Lite Mail	IBM PCs and compatibles	DOS 3.3 or later	Netware, Netware Lite, Vines, IBM PC LAN	NA/256K	NA	Voice mail capabilities, blind carbon copies, carbon copies, fax sending/receiving, fax rotation, import/export ASCII	Stores mail in folders, saves copies of all mail sent, searches across all folders for mail, ability to archive selected message	Header, text, keyword	No	None	No	SNADS, SMTP, MHS, X.400, all gateways supported through MHS	Password	4K to 6K	Context-sensitive Help	$39.95 per user
	Right Hand Man for DOS	IBM PCs and compatibles	DOS 3.3 or later	Netware, Netware Lite, Vines, IBM PC LAN	NA/256K	NA	Voice mail capabilities, blind carbon copies, carbon copies, fax sending/receiving, fax rotation, import/export ASCII	Stores mail in folders, saves copies of all mail sent, searches across all folders for mail, ability to archive selected messages	Header, text searches, keyword	No	None	No	SNADS, SMTP, MHS, X.400, all gateways supported through MHS	Password	4K to 6K	Context-sensitive Help, calendar, notepad, print queue manager, real-time chat, personal/group scheduling	$495 for five users; $1,995 for 25 users, remote access available through Right Hand Man Remote
	Right Hand Man for Windows	IBM PCs and compatibles	DOS 3.3 or later, Windows 3.0	Netware, Netware Lite, Vines, IBM PC LAN	NA/256K	NA	Voice mail capabilities, blind carbon copies, carbon copies, fax sending/receiving, fax rotation, import/export ASCII	Stores mail in folders, saves copies of all mail sent, searches across all folders for mail, ability to archive selected messages	Header, text, keyword	No	None	No	SNADS, SMTP, MHS, X.400, all gateways supported through MHS	Password	4K to 6K	Context-sensitive Help, calendar, notepad, to-do lists, print queue, common user access, database	$495 for five users; $1,995 for 25 users
Hewlett-Packard Co. (800) 752-0900	HP Open Mail	HP 9000, IBM RS/6000, Decstation, Sequent	DOS 3.1 or later, Windows 3.0, Unix, Mac OS, Netware	LAN Manager	6M/NA	2.6M to 3.5M	Blind carbon copies, message and address templates, carbon copies, fax sending/receiving, multiple windows, X.400 standards supported	Stores mail in folders, saves copies of all mail sent, automatic forwarding, stores folders on local drive, ability to archive selected messages, hierarchical folders, upon APIs to enable plug-in applications	Via third-party products	Yes	Both	Yes	SMTP, MHS, X.400, fax, telex, HP Desk Manager	Password, encryption of messages stored on server (via third-party product)	NA	Context-sensitive Help, spell checker, automatic distribution, message filter	$250 per user
Logan Industries, Inc. (407) 984-1627	CMail	IBM PCs and compatibles	D.R. Concurrent DOS 386	D.R. Net	64K/64K	80K	Carbon copies, import/export ASCII	Stores mail in folders, automatic forwarding	No security features	Yes	None	No	MHS	Password, encryption of messages stored on server, encryption across network	NA	Appendix files	$129 per CPU (each CPU may have up to 10 users)
Microsoft Corp. (206) 882-8080	Microsoft Mail for PC Networks Version 3.0	IBM PCs and compatibles	DOS 3.31 or later, OS/2 Presentation Manager, Windows 3.0, Mac OS	Netware, Netware Lite, Vines, IBM PC LAN, LAN Manager	640K/384K (DOS), 2M (Windows), 4M (OS/2 Presentation Manager)	1M	Carbon copies, rules to manage messages, screen capture utility, multiple windows, fax sending/receiving, import/export ASCII, fax rotation, voice mail integration, address templates, OLE support, attachments integrated in message text, five levels of message priorities, registered mail, global address list	Stores mail in folders, saves copies of all mail sent, stores mail on local drive, searches across all folders for mail, hierarchical folders, drag and drop foldering, dynamic, persistent message filters on sender, recipients, subject, message text	Header, text, sender, subject, recipients	Yes	Automatic	Yes	SNADS, Profs, SMTP, MHS, X.400, MCI Mail, fax, HP Desk, GE Quikcom, Microsoft Mail for Appletalk networks	Password, encryption for messages stored on server, encryption across network	90K	Context-sensitive Help, spell checker	$695 for Microsoft Mail server for PC Networks; $395 for five-pack workstation license; $1,349 for 20-pack workstation license; $5,500 for 100-pack workstation license
	Microsoft Mail for Appletalk Network Versions 3.0	Macintosh	DOS 2.0 or later, Mac OS 6.02 or later	Appletalk, Ethertalk and compatible networks	1M/512K (DOS), 1M (Mac OS)	Dependent of number of users	Carbon copies, multiple windows, fax sending/receiving, import/export ASCII, blind carbon copies, custom forms, address templates, voice and graphics support in messages, return receipt option	Stores mail in folders, saves copies of all mail sent, drag and drop foldering	subject, sender, date	Yes	Automatic	Yes	X.400, Profs, SMTP, MHS, VMS, SNADS, Applelink, MCI Mail, Fax, Microsoft mail for PC networks	Password, encryption of stored messages on server, encryption across network	NA	Context-sensitive Help, automatic data backup, extensive administration reports, multi hop routing, integrated scheduling with Microsoft Schedule+	$395 for five-user Mac workstation; $1,349 for 20-user Mac workstation
Notework Corp. (617) 738-5295	Notework	IBM PCs and compatibles	DOS 2.0 or later, Windows 3.0	Netware, Netware Lite	NA/5K	500K	Form capabilities, blind carbon copies, message and address templates, carbon copies, screen capture utility, fax sending/receiving, multiple windows, import/export ASCII, flash telephone messaging, broadcasts, attach files to notes, receipt of confirmation, nonintrusive mail notification, print message	Stores mail in folders, saves copies of all mail sent, automatic forwarding, searches across all folders for mail, ability to archive selected messages	Header, text, sender, subject, date, keyword	Yes	Automatic	Yes	SNADS, SMTP, MHS, X.400, MCI Mail, UUCP, IBM Profs, fax, DEC All-In-1, VMS mail, Compuserve	Novell Security	5K	Automatic distribution	$99 for system; $399 for 10 users; $1,499 for 50 users; $99 for remote access
OCP International Ltd. (818) 892-5192	OCP-Mail (MHS), OCP-Mail 400	IBM PCs and compatibles, Macintosh	DOS 3.1 or later, OS/2, Windows 3.0	Netware, Netware Lite, Vines, IBM PC LAN, all PC LAN supported networks	512K/640K, 2M (Windows)	2.5M	Voice mail capabilities, blind carbon copies, message and address templates, carbon copies, fax sending/receiving, multiple windows, import/export ASCII, full X.400 compatibility	Saves copies of all mail sent, automatic forwarding, ability to archive selected messages, searches across all folders for mail, external archives	Header, text, sender, subject, date, keyword	Yes (Windows), No (DOS)	Manual	No	SMTP, MHS, X.400	Password, encryption of messages stored on server	NA	Context-sensitive Help	$920 for 10 users; $7,880 for 200 users, $368 for remote access



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OSIware, Inc. (604) 436-2922	Messenger 400 for DOS	IBM PCs and compatibles	DOS 3.1, OS/2, Windows 3.0, Unix	Netware, Asynch, X.25	640K/640K	20M client, 40M server	Blind carbon copies, carbon copies, rules to manage messages, multiple windows, import/export ASCII	Stores mail in folders, saves copies of all mail sent, stores folders on local drive, searches across all folders for mail, ability to archive selected messages	Header, sender, subject, date, message status	No	Manual	No	SMTP, X.400, RFC 987 , Profs	Password	NA	None	Contact vendor
Beach Software Corp. (408) 733-8685	Mailman	IBM PCs and compatibles	DOS 3.1 or later, Windows 3.0	Netware, Vines	NA/2M (Windows)	2M	Form capabilities, blind carbon copies, message and address templates, carbon copies, fax sending/receiving, rules to manage messages, multiple windows, import/export ASCII, mail enable work flow	Stores mail in folders, saves copies of all mail sent, automatic forwarding, stores folders on local drive, searches across all folders for mail, ability to archive selected messages	Configurable	Yes	None	NA	NA	Password	NA	Context-sensitive Help, spell checker	$995 - $1,995 package price
S&H Computer Systems (615) 327-3670	Message Net	IBM PCs and compatibles, DEC VAX	DOS 3.3 or later, VMS, TSX-32	TSX-32	4M/640K	10M	Form capabilities, blind carbon copies, screen capture utility, fax sending, rules to manage messages, import/export ASCII	Stores mail in folders, saves copies of all mail sent, automatic forwarding, stores folders on local drive, searches across all folders for mail, ability to archive selected messages	Header, text, sender, subject, date, keyword	Yes	None	Yes	MCI, Easylink	Password	NA	Automatic distribution	$750 starting price; $200 per user for remote access
3rd Plant Software, Inc. (310) 841-2260	Easy mail	IBM PCs and compatibles	DOS 3.0, Windows 3.0	Netware	1M/100K	360K	Message and address templates, import/export ASCII	None	No searching capabilities	No	None	No	None	None	NA	Context-sensitive Help	$295 for package price
Sitka Corp. (510) 769-9669	Inbox Plus 3.0	IBM PCs and compatibles, macintosh	DOS 5.0, Mac OS	Netware, Vines, IBM PC LAN, Tops	NA/345K (DOS)	610K	Form capabilities, blind carbon copies, message and address templates, carbon copies, screen capture utility, fax sending/receiving, fax rotation, rules to manage messages, multiple windows, import/export ASCII	Stores mail in folders, saves copies of all mail sent, stores folders on local drive, ability to archive selected messages, hierarchical folders	Header, sender, subject, date, keyword	Yes	Automatic	Yes	SMTP, X.400	Password, encryption of messages stored on server, encryption across network	18K	Context-sensitive Help, automatic distribution	$995 for 50 users; $1,995 for 100 users; $5,995 for 250 users
Transend Corp. (410) 290-5900	Complete-Mail/MHS	IBM PCs and compatibles	DOS 3.0 or later, Windows 3.0	Netware, Netware Lite, Vines, IBM PC LAN	NA/320K	500K	Form capabilities, blind carbon copies, message and address templates, carbon copies, rules to manage messages, import/export ASCII	Saves copies of all mail sent, automatic forwarding, stores folders on local drive, searches across all folders for mail, archives selected messages	Header, sender, subject, date	Yes	None	No	MHS, X.400, all MHS gateways	Password, encryption of messages stored on server	25K	Context-sensitive Help, automatic distribution	$295 for five users; $495 for 10 users; $695 for 25 users
Verimation, Inc. (201) 767-4795	Memo	IBM PCs and compatibles	DOS 3.0, Windows 3.0	Netware, IBM PC LAN	NA/200K	900K	Form capabilities, message and address templates, fax sending	Stores mail in folders, saves copies of all mail sent, searches across all folders for mail, ability to archive selected messages	Header, text, sender, subject, date	No	None	Yes	SNADS, X.400	Password	NA	Context-sensitive Help	$4,000 - $16,000 for complete site
Wordperfect Corp. (801) 225-5000	Word Perfect Office 3.1	IBM PCs and compatibles, Macintosh workstation	DOS 3.0, Windows 3.0, Unix	Netware, Vines, IBM PC LAN	512K/512K	1.2M	Form capabilities (Macintosh), blind carbon copies, message and address templates, carbon copies, screen capture utility, fax receiving, multiple windows, import/export ASCII	Stores mail in folders, saves copies of all mail sent, stores folders on local drive, searches across all folders for mail, ability to archive selected messages	Sender, subject, date	Yes	Automatic	No	MHS, X.400, MCI Mail, Easylink (sold separately)	Password	5K	Context-sensitive Help, spell checker	$495 for five users; $1,494 for 20 user

Getting the most from your E-mail

BY KEVIN WILSON

There are as many ways to use an E-mail system as there are people using them. From hospitals to manufacturers to banks to universities, companies are using these systems to speed up customer service, enhance internal communications and organize employees' work schedules.

Here's a look at some E-mail features and how you can make the best use of them.

BULLETIN BOARDS: Electronic bulletin boards function more or less like their hard-copy counterparts but without the clutter. Personnel departments can post notices such as position vacancies so that remote sites can view them. Information systems departments can notify employees of system scheduling, outages and modifications.

DISTRIBUTION LISTS: Do you want to send a message to 300 employees? Just type in the name of a distribution list that contains each employee's user identification, press a key, and your message is on its way.

Companies with national branches will find this function especially useful. For instance, if a national bank wants to use E-mail to broadcast index changes and current interest rates to outlying branches, distribution lists can send information relevant only to the East Coast to that region alone, while targeting state-specific information to work groups in particular states.

GATEWAYS: Gateways allow users of a particular E-mail system to send messages to and receive messages from other E-mail systems (see story page 83). They also enable users to send E-mail messages as fax or telex transmissions.

Companies such as manufacturing operations can use fax gateways to speed response time to customer inquiries. When customers call to place an order, a customer service representative can log onto a database of customer fax numbers. The E-mail system can then format the message, autodial a public E-mail service such as AT&T's toll-free Easylink number and transmit the message as a fax document.

USER EXITS: User exits limit or define message transmissions. For instance, a user exit can automatically add a banner page or boilerplate text to every message you send. Or it can dictate to whom you can send a message.

Let's say you write an E-mail message to the company president. If the president isn't in the group of recipients the user exit has defined, your message will be handed back to you, along with the notation "access denied."

Though user exits can be used restrictively, they can also open up alternative lines of communication.

For example, some companies use them to allow vendors and customers access to their E-mail system. Qualified vendors can work directly with manufacturing plants and corporate headquarters, thereby being treated more like staff members.

Similarly, customers of the company can send administrative messages, make design-change requests and confirm order status through E-mail, any time of the day or night.

FORM GENERATION: Many E-mail systems can electronically create, fill out and file commonly used forms. For instance, an office manager can streamline the company's requisition process. If someone at a branch needs office supplies, he can fill out an on-screen electronic form and send it to the central supplies office.

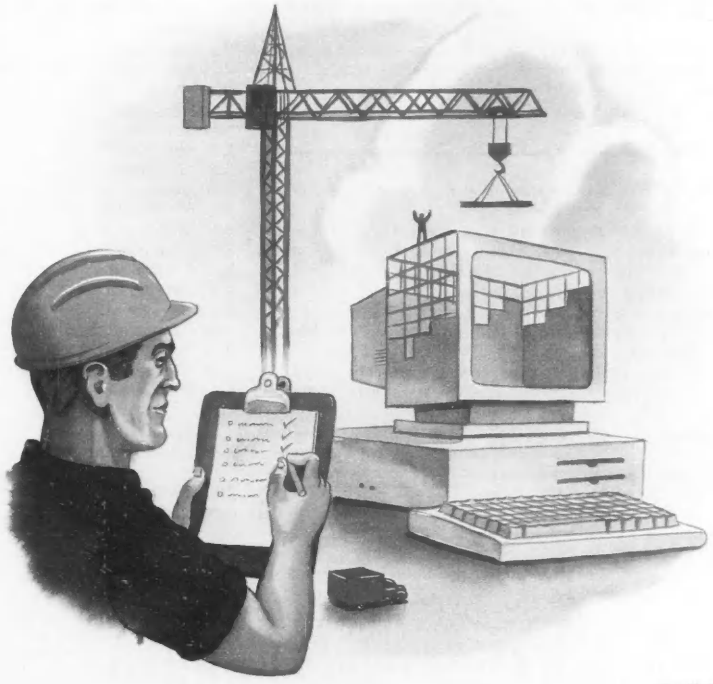
At the supplies office, the "E-form" prints out in duplicate, the electronic stock room in-basket is updated, and the order is promptly filled.

One bank that now processes, tracks and verifies requisitions through E-mail says it has trimmed seven to 10 days from the fulfillment cycle for employees requesting software, hardware or telecommunications equipment and services. •

Wilson is the owner and director of Words & More, an editorial consulting firm in Boise, Idaho.

Build me a system

A new approach to system engineering puts more emphasis on the finished IS product than on the process that gets you there



Ross MacDonald

BY ASHER YUVAL
AND DROR CHEVION

The senior information systems staff for the government of Israel had assembled in the budget department one day in May, and tempers, as well as the Mediterranean air, were heated. The group needed to put together a software system for the Ministry of Finance, but instead of coming up with a solution, they became embroiled in a debate over the regulations for handling a system throughout its life — from concept to development to maintenance.

Yuval is president and founder of Methoda Computers Ltd., an independent consulting firm in Jerusalem. Chevion is director of government information technology at the Israel Ministry of Finance, office of budget.

One manager urged the ministry to incorporate a strict methodology so that no project could go forward without conforming to it exactly. Others opposed that idea because they feared for their projects under such rigid standards.

Somewhere amid the heat and raised voices, the idea of a System Engineering Framework (SEFR) was conceived. SEFR has since become the standard guideline at the ministry — and for the rest of the Israeli government offices, an Israeli power company and a construction firm — for analyzing, designing, building, operating and maintaining information systems. It is structured enough for consistency but open enough to give everyone room for their tools and techniques, equipment and style.

Although not yet used outside Israel, SEFR is a framework that companies worldwide can use to ensure they not only get the systems they need but also care for those systems appropriately.

The revelation that produced this new set of principles for the ministry was simple: Too much time was being spent looking at processes, to the detriment of the end product.

Cutting wasted time

Unlike certain methodologies, SEFR focuses on the system to be produced (the "what") rather than on the process (the "how"). The framework is noteworthy because it describes the goal of an IS project — namely, what the final IS product will be and what it will look like. IS staffers are free to figure out how to produce and maintain the product in the most cost-effective, efficient manner.

SEFR gives the IS end product priority because its central concept is the idea of engineering through a bill of material approach. A bill of material is a standard list of all components and subcomponents that make up a product. A bill of material is often depicted as a tree, the trunk of which is the finished product, with the furthest branches being raw materials. Intermediate branches are often finished or semifinished products.

Although people in the IS world talk a lot about systems engineering, building a system is not usually approached with anything like an engineer's mind-set. The bill of material approach views the entire information system as though it were any other engineered product composed of well-defined components. SEFR's bill of material plays off the idea that information systems are more similar in structure than unique and can be "machined" like any other product.

IS shops have a common tendency to focus so much on the differences in information systems that they miss the similarities of components such as operational interfaces, data items, logical files and information security needs. For example, a population registration system and a financial system might seem very different on the surface. However, when you think of the actual components and actions required to produce and maintain them, they are very much alike. Both use databases and a query language, and both require telecommunications and security.

The beauty of SEFR and its bill of material is that *all* questions relating to what the

Continued on page 94

- **How the model helps in subcontractor selection**
- **The engineering life cycle connection**
- **Classifying CASE tools**

system is supposed to do, what components it should include, how it should be built and maintained and how much it should cost are answered and defined.

The upshot is that SEFR, with its standard bill of material, offers centralized and unified regulations while enabling decentralized implementation and operation. Because it provides consistency to projects, it improves total system quality. Putting less stress on describing exactly how to do everything and more on what the result should be creates standard components that are interchangeable and interoperable.

SEFR and its bill of material should be a tangible thing given out to all interested parties — IS staff, administrators, quality control personnel, business managers and legal advisers. It offers them common terms of reference for systems being developed and maintained, which helps reduce discord. Therefore, it should be put in the form of a comprehensive guidebook and include templates for analysis, testing and maintenance and diskettes complete with prefabricated forms for documentation. In this way, SEFR becomes an IS organization's "bible."

As such, SEFR helps projects move forward because time, energy and resources are not wasted on unnecessary activities and materials.

The nitty gritty

The five major components of SEFR's bill of material model are standard. They serve all those who participate in a project — the IS staffer who specifies system requirements, the one who builds the system and the one who tests and maintains it. These components are as follows:

▶**Goals.** The system must serve clear, achievable goals tied to the proper functioning of the organization. Goals are defined to include problem analysis, cost/performance analysis, organizational structure, IS strategic planning and so on.

▶**Application.** This component encompasses the essence of the system — its subsystems, functions, data, transactions, reports, files, data items and so on.

▶**Technology.** This refers to proven off-the-shelf products. Technology consists of all those components needed to develop, operate and maintain an information system acquired from an external source such as a hardware vendor or software house. Technology includes system software, such as computer languages, databases, application generators, software engineering tools and so on.

▶**Realization (implementation).** This component handles the joining together of the other components, primarily application and technology, into an intermediate or final working solution. It contains the project grand plan, the specific plan for documentation and data conversion, a testing plan, organization and methods and so on.

▶**Cost (resources).** This is a key part of the IS bill of material. Under SEFR, all expenses related to the system are taken into account.

To build a SEFR bill of material template for an organization, start with the above components, then fill out the rest by studying existing information systems in operation. This way, the IS bill of material will contain all the physical and logical components and subcomponents (and yes, even subsubcomponents and below) necessary for a fully operational information system.

When completed, the bill of material should look something like the following:

1.0 Goals. Specific subcomponents include:
1.1 Department that requested the system.
1.2 System objectives.
1.3 Problems requiring solutions.
1.4 Enterprise structure. This shows a breakdown of the company's entire organizational structure, with emphasis on that of the department in need.

This component gives a better picture of the context in which the system will operate.
1.5 Reference to annual work plan.
1.6 Expected benefits and savings.
1.7 Main milestones (time span), including minimum system life expectancy.

2.0 Application (the essence of the system). Subcomponents include:
2.1 General application status and main application characteristics.
2.2 User needs.
2.3 Subsystems and their major functions.
2.4 Operational interface: screens and menus.
2.5 Processes.
2.6 Transactions.
2.7 Modules.
2.8 Subroutines.
2.9 Tables.
2.10 Logical files.
2.11 Physical files.
2.12 Data items.
2.13 Glossary.
2.14 Information security.
2.15 Cross-references.
2.16 Work load and performance.
2.17 Interconnection with other applications.
2.18 System robustness.
2.19 Special requirements.

3.0 Technology. Specific subcomponents include:
3.1 Main hardware.
3.2 Data storage: brand of diskettes, tape, etc.
3.3 Peripherals (workstations).

All hands on the same deck

SEFR and its IS bill of material is a good document to have in hand when outsourcing as well as subcontracting throughout the life cycle. By adhering to the IS bill of material, a company can ensure that all projects handled by outside contractors fit in with its overall IS framework.

Because the IS bill of material is a working document with slots filled in by IS staffers, it can become part of the request for proposal (RFP) process.

The IS staff sends the vendor a copy of the bill of material, specifying the requirement of a department's project. The vendor is required to respond to that specification with features and technologies it thinks are appropriate. For example, it would fill in a suggestion for screens in the correct slot, keeping in mind the description of the project and its goals, applications, relevant technology, implementation and cost.

When you present a well-defined RFP to vendors in the form of a bill of material, it increases the likelihood of your getting clear-cut, relevant responses. Furthermore, when all contractors present their proposals in the bill of material format, it makes evaluation and comparisons much easier for the IS staff.

SEFR: Just going through a (life cycle) phase

BY ASHER YUVAL
AND DROR CHEVION

The IS bill of material concept is by no means a substitute but rather a complement to the classic software engineering life cycle concept. System Engineering Framework (SEFR) presents a life cycle model very similar to standard models that contain the classical phases of initiation, analysis, design, code, testing and so on.

SEFR covers the entire engineering process, from development to maintenance. Throughout the entire process of development and maintenance, SEFR carefully considers all components of an information system, including hardware, infrastructure and organizational implications.

The interweaving of SEFR and the life cycle yields a matrix approach to software engineering. In keeping with the manufacturing analogy in which SEFR is likened to a product tree, the life cycle might be likened to a work breakdown structure that delineates the steps to manufacturing the product.

Coming together

The IS bill of material complements the classic software engineering life cycle. The bill of material concentrates on the product, while the life cycle delineates the steps to manufacturing and caring for the product.

IS bill of material					
Goals	Estimated	Defined	Complete	Maintained	Works well
Application	Estimated	Defined	Complete	Works well	New demands
Technology	Unknown	Prototype	Complete	Continual adjustment	Should be replaced
Realization	Unknown	Partially defined	Complete	Maintained	Needs changes
Cost	Estimated	Prototype	Complete	Deviates from plan	Needs to be fixed
	Initiate	**Analysis**	**Design**	**Testing**	**Maintenance**
	Life cycle				

Source: Asher Yuval, Dror Chevion

CW Chart: Michael Siggins

Reading the matrix

The interconnection between the bill of material and the life cycle can be seen by picturing a matrix setup (see chart at left). The vertical axis is made up of the five major SEFR bill of material components. The horizontal axis contains the five major life cycle phases.

A horizontal look at the matrix shows the transition of each individual component as a project progresses through the life cycle. The application component, for instance, can be dubbed "estimated" in the initiation phase and "defined" in the analysis phase and can finally reach "complete" in the design phase. Yet the component always remains "application." The bill of material as a whole — and each component in particular — remains the same throughout the life cycle, ensuring consistency and quality.

The vertical view of the matrix depicts the contribution of each stage of the life cycle to the progression of the bill of material. Each column indicates the state of each component at any particular life cycle stage. Each phase can be evaluated in terms of the progress of the IS components; a phase in which no component is enhanced in a particular project is redundant. You should eliminate or combine redundant phases with others to avoid having too many phases.

Keep in mind that the SEFR bill of material approach is not dependent on the software engineering life cycle and can be used anytime to guide and manage a project. In this way, SEFR can be implemented at any intermediate phase in the IS life cycle. For instance, IS projects not using SEFR at the analysis or design phases can begin to do so at the testing or even at the maintenance phases.

The combination of the bill of material with the life cycle in a matrix approach enables SEFR to serve both IS professionals and non-IS personnel, such as comptrollers and managers, at all levels in the process of IS implementation. The previously frequent phenomenon — in which IS and business managers sitting together on a procurement committee would speak different languages, refer to the life cycle in different terms and argue about where a system was — is finally over. •

3.4 Special equipment.
3.5 Infrastructure (physical environment).
3.6 Operating system.
3.7 Database and file organization.
3.8 Data dictionary.
3.9 Computer-aided software engineering tools.
3.10 Query and report generators.
3.11 Operation tools.
3.12 Security tools.
3.13 End-user tools, such as spreadsheets.
3.14 Local-area network.
3.15 Wide-area network.
3.16 Public data network.
3.17 Tangent technologies.

4.0 Realization (implementation). Subcomponents include:
4.1 Working teams: IS professionals and business managers needed.
4.2 Grand plan: who will do what for how long (resources, manpower, schedules, milestones).
4.3 Next step plan: full system analysis.
4.4 Operations.
4.5 Documentation.
4.6 Service and maintenance.
4.7 Training.
4.8 Test plan.
4.9 Incremental configurations.

5.0 Cost. Subcomponents include:
5.1 Installation costs, including development, training and testing costs.
5.2 Running costs (for a five-year period).
5.3 Configuration costs: how much per incremental configuration (see 4.9).
5.4 Item costs: vendor price lists.
5.5 Total cost of ownership.

All existing data should fit into the appropriate subcomponent slots in the bill of material list. Existing items such as reports, screen layouts and so on should be entered into the appropriate slot.

For example, under the subcomponent "hardware," enter whatever helps define the hardware of the system. If the IS staff is working within the analysis phase of a project, filling in the slot would require asking such questions as: Is it imperative to work with this hardware? Is this hardware appropriate for the application? Does the hardware meet requirements? Is it overkill?

Note that it is not uncommon for some slots to remain empty. These empty slots indicate areas to concentrate on, and it is up to the project team to decide how it wants to deal with these unfilled slots. Component slots can be empty for two reasons: The project doesn't need them (for instance, a LAN) or the IS team has not yet specified what should fill a slot (for example, it knows it needs a database but not what kind of database). The team either fills in empty slots with minimal specifications or deems them irrelevant.

The point is that even if a slot is unfilled, the item it represents will not be forgotten or lost. It can be taken care of in the future as needed.

Tinker, tailor

As the SEFR bill of material is broken down into levels of subcomponents, each level refers to a particular segmentation of a systems engineering effort. So while the five major categories remain consistent and refer to systems overall, lower levels can refer to industry-standard items or items specific to a particular project. In this way, SEFR enables flexibility but does not disregard specific needs of individual business projects.

The incorporation of current industry standards into lower level components in the bill of material, such as operating systems, communications, languages, databases and documentation, is straightforward. For example, the IS staff may want to ensure the use of open systems in all its networks. Hence, under subcomponent 3.15 (wide-area network), it would indicate the use of Open Systems Interconnect and dub that 3.15.1.

In the case of the Israeli government, the general SEFR model has been tailored to meet specific government needs. For instance, the data items dictionary subcomponent of the application bill of material component (2.12) has been tailored to become the government's standard data items dictionary. It serves as a basis for electronic data interchange.

The same is true for organizations. Businesses using SEFR, such as a major bank, a power company and a construction company in Israel, have applied a similar customization process, integrating their particular culture and regulations into SEFR's lower level components.

For example, subcomponent 2.9 refers to tables. The guidelines around this component in SEFR emphasize the importance of parameterized tables and the use of table management tools. In many organizations, a central library of organization tables and management tools already exists, and the organization has already developed a system for making and using tables. This organization can merge its own existing regulations regarding tables under the more general 2.9 component.

By the time IS gets down to the lowest level components, it should be referring to items that deal with a specific project and the building of a specific information system. In the end, SEFR and its bill of material approach provide the path to follow but also enable IS staffs to drill down to a level of detail that gives them direction on specific projects. •

Cutting to the chase

SEFR helps you eliminate inappropriate tools

SEFR serves as an excellent guideline for the selection of specific CASE tools.

Currently, IS often approaches selecting a CASE tool from a micro viewpoint; that is, IS immediately goes through the process of thoroughly evaluating a tool only to find that the tool is inappropriate.

SEFR makes IS first conduct a more general evaluation in which the basic nature of the CASE tool is determined.

The macro approach of SEFR can help answer major questions, such as the following: What sort of tool is it? Where in the life cycle does it fit? What areas of the bill of material does it cover? What is its main purpose? This approach will help eliminate inappropriate tools much more quickly.

The bill of material/life cycle matrix used in SEFR provides quick and universally applicable guidelines for CASE tool classification (see chart below). The vertical axis is the bill of material components; the horizontal axis is the engineering life cycle phases.

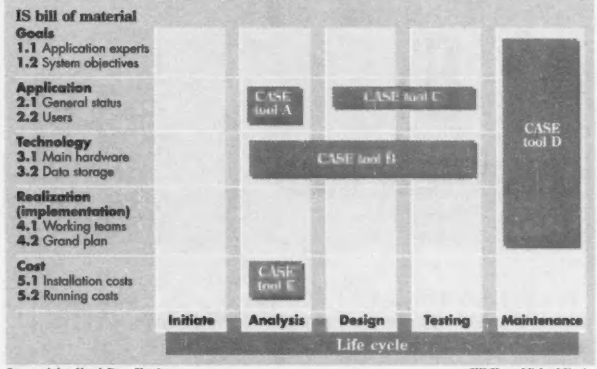
CASE tools can be placed on the matrix chart to show how they relate to the IS bill of material components and life cycle phases. For example, CASE tool E covers the bill of material cost component at the life cycle's analysis phase.

CASE tools can cover more than one square. That is, they can cover the entire life cycle and perform a phase for every component of the IS bill of material. For example, CASE tool C relates to the application component throughout the design and testing phases. By using tool C, IS can design and test the application components of the system.

The matrix will likely reveal that many of the analysis tools currently on the market cover only the application component, and additional tools are required to complete the analysis phase.

Classified material

You can classify CASE tools by plotting them on a matrix made up of standard bill of material components and system life cycle phases. Those CASE tools that match up with the life cycle phases and system components important to your firm will be most effective.



Source: Asher Yuval, Dror Chevion

CW Chart: Michael Siggins

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MANAGER'S JOURNAL

IN BRIEF

Mellon's ex-IS chief weighs offer



Retired Mellon Bank information systems chief **George DiNardo** is considering an offer to become a full professor at the business school at **Duquesne University** in Pittsburgh. DiNardo is currently an adjunct professor of business at Carnegie Mellon University and runs a consulting firm, DiNardo Associates, that specializes in advice on data center consolidations.

DiNardo retired from Mellon in early 1991 after a long career at the Pittsburgh-based money center bank.

■ **Princeton Packaging, Inc.** announced an eight-year outsourcing contract with **Affiliated Computer Services, Inc.** (ACS). Both companies are based in Dallas. The pact calls for ACS to manage Princeton Packaging's data center and upgrade its operating systems. Financial terms were not disclosed.

ACS also announced a five-year services contract with **Trans National Communications,** a division of Boston-based Trans National. ACS will provide call rating and billing, customer service and back-office processing.

■ **Canada Post Corp.** has inked a three-year deal with **SHL Systemhouse, Inc.** for systems management services for Canada Post's nationwide computerized Trace Mail System. The $9.7 million contract calls for Ottawa-based Systemhouse to deliver software enhancements, field support and a 24-hour hot line to Trace Mail users in Canada.

■ **QUOTE OF NOTE:** "If your company does not view information as an asset, no golf lesson you take or image consultant you hire will help you play at the senior corporate level." — **Leilani Allen,** senior vice president of information technology, Sears Mortgage Corp., at the Applied Computer Research, Inc. System Development Conference in Phoenix.

Honing in on target customers

Reader's Digest overhauls flagship database for direct mail marketing efforts

BY JOHANNA AMBROSIO
CW STAFF



Joyce Ravid

Kenneth A. Nelson, *vice president of MIS, 'plans a new level of sophistication' for Reader's Digest's marketing database*

Amid the sleepy, rolling hills of Westchester County, N.Y., Reader's Digest Association, Inc. is developing the marketer's version of a smart bomb.

After its completion in five years, Reader's Digest's Customer Information Management System (CIMS) will allow the company to hone in on customers more accurately than ever before.

The first phase of the multimillion-dollar, homegrown CIMS will make its appearance later this year.

"They are trying to dejunk" direct mailings by making sure "only the right people get the right mail," says Alan Gottesman, a media analyst at Paine Webber, Inc. in New York. "If that's not massive databasing, I don't know what is."

"The Digest," as company insiders call the far-flung and diversified empire that makes its headquarters in Pleasantville, N.Y., is part publisher, part marketer and by most measures a striking success, especially given the economic situation around the world. The organization publishes 41 editions of *Reader's Digest* in 17 languages, with its first overseas unit established in the UK in 1938.

In addition to the company's well-known magazine, which Reader's Digest executives claim is the most widely read in the world, Reader's Digest publishes condensed books, book series and specialty magazines and sells books and videos. The magazine, in fact, contributes only about a third of its revenue in any given year.

The company reported sales for the fiscal year ending June 30, 1991, of $2.4 billion, an increase of 14% from the year before. Net profit for the same period was up 15%, to $214 million.

A large part of this success is due to the 23-year-old database system that tracks the likes and dislikes of 100 million customers worldwide. It is

Continued on page 98

Levi's takes the starch out of IS paradigm

BY JEAN S. BOZMAN
CW STAFF

Imagine a circle. Now imagine that the circle represents the structure of your information systems department. At Levi Strauss & Co., the staff members do not have to imagine it: It is the new paradigm for the way IS functions are managed at the $5 billion apparel and jeans company.

The circular organizational chart, as it has come to be known, has been circulating through the pastel-colored halls of Levi's for several months now. It is a symbol of an IS organization that is being re-engineered right along with the computer systems it creates and supports.



As currently drawn, Levi's circular chart resembles a solar system, with the names of 20 IS managers appearing once on a large circle — and in many cases, also on one of four smaller circles that intersect the large one. The small circles represent "action groups" that focus on specific tasks, including customer service, business systems and information services.

Chief Information Officer Bill Eaton says the chart was a very practical solution to a real-world problem. "We're a big team," he said, "and you can only do things as part of a team." The information resources management team includes 20 of the 438 IS staff members at Levi's worldwide.

Meetings, whether at Levi's headquarters near San Francisco's waterfront or at off-site retreats, help to break down the traditional communication barriers that stem from the old hierarchical reporting systems. "We plan our calendars more than a year in advance to lock in the off-sites," said Eaton, who is on Levi's executive management committee — representing the company's top nine executives.

Donna Rund, Levi's director of information engineering, is one of the managers who helped to bend the IS chart into a circle. She leads off-site meetings and encourages changes in the work environment — including peer reviews.

"It's very, very clear to me that functional boundaries are beginning to disappear," she said. "In the future, we will not be working in defined hierarchies, as we are now. There will be more collaboration, more teamwork and more trust based on a new [corporate] culture."

This movement to embrace change, Eaton explained, comes from intense analysis and discussion following Levi's corporate downsizing during a leveraged buyout in the mid-1980s. It also reflects the company's Aspirations mission statement, endorsed by Chief Executive Officer Robert Haas, which lists six management touchstones: new behaviors, diversity, recognition, ethical management practices, communication and empowerment.

"There's a movement of information from desktop to desktop. We must solve the boundary problems between PCs and mainframes — and we must do it on a global basis," Eaton said.

Honing in on target customers

CONTINUED FROM PAGE 97

this system, now called the Unified File System (UFS), that will be turned into CIMS during the next five years.

"Over the years, we've been industry leaders in the use of systems in list management and direct mail marketing, and we intend to maintain that leadership position as we move into the future," says George V. Grune, chairman and chief executive officer.

Reader's Digest has rethought its original "Big Bang" approach of introducing the entire CIMS all at once, says Kenneth A. Nelson, vice president of MIS. Current plans call for introducing the core part of CIMS in the U.S. this year and then rolling it out around the world.

"Think of UFS as going away gradually, CIMS replacing it, and then CIMS being the foundation for our worldwide systems portfolio," Nelson says.

Like the makers of that other smart bomb, Nelson and other employees are extremely reluctant to reveal details about CIMS — which is not entirely surprising, given that executives and Reader's Digest publications have termed the database the empire's "crown jewel." Says a company spokesman: "People would kill to learn how we do what we do."

Nelson will say only that CIMS will bring the existing UFS system "to a new level of sophistication" that the company hopes will increase response rates and lower mailing costs. It will likely be based on IBM's DB2 database management system. Reader's Digest developed its own DBMS for UFS because of the lack of a viable commercial DBMS back in 1969.

The conversion effort will likely keep Reader's Digest's 400 Pleasantville-based IS employees busy for a while. The IS staff accounts for about a fifth of all U.S. company employees.

Whatever the technical details, most observers agree that the general idea works like this: Reader's Digest buys mailing lists from a variety of sources or gets names from customers who subscribe to the magazine or to one of the book series. The company then opens a computerized file on the particular customer, does exhaustive research from various sources and mails the customer surveys whose results are guaranteed to stay private by the firm's promise not to sell or give its data to any other organization. Those results are then entered into the database to target product offerings.

If, for example, a customer were to subscribe to a book series about Japan, the company, figuring that the customer is probably interested in other Asian items, might send that person brochures describing videos about China or cassettes with songs from the Philippines. Depending on what the customer buys or — equally important — what he rejects, the database grows from there.

Reader's Digest also solicits its customers' opinions on potential new publications and enters that information in the UFS database, where market planners can access the data as needed.

As reticent as Reader's Digest may be about its database details, executives are positively chatty about the company's plans to build a global IS infrastructure. "We're trying to take some of our great products and great ideas and move them around the world faster," Nelson says. "It's accelerating a process that already exists."

The major tenets of the globalization plan are the following:

- Consolidate 17 data centers down to three — one in Pleasantville to service North America, one in Europe and one in the Far East. These data centers, all patterned after the $20 million Pleasantville facility, will house IBM mainframes running MVS and will be connected.
- Have a common set of core applications such as CIMS, with applications (payroll, for example) that reflect some regional or country-by-country differences.
- Build a worldwide communications network with leased lines, satellites, fiber optics and whatever other medium makes the most sense, and then build "value-added" services on top of the basic network.

Users in Montreal, Mexico City and Pleasantville recently gained access to videoconferencing, electronic mail, electronic bulletin boards and phone mail when that part of the global network was completed.

"We want to bring the best minds of Reader's Digest logically together regardless of where they physically might exist, to take distance and time zones as much as possible out of our day-to-day business," Nelson says. "That way, people can share the successes and the failures, learn the lessons and then transfer that around the world."

Nelson says outsourcing the data centers is "not in the cards. IS is one of the core competencies of our business, and you don't walk away from it if you're serious about this business for the long haul."

What's on tap for '92 at Reader's Digest

- The first rollout of the Customer Information Management System, the next generation of a homegrown application to match customers' wants and needs with specific products.
- Continuing data center consolidation of 17 worldwide data centers into three. Next in line: Mexico City, which will be linked into the North American regional site in Pleasantville, N.Y.
- The beginnings of the European regional data center.

CALENDAR

MARCH 1 - 7

Share '92. Anaheim, Calif., March 1-6 — Contact: Pam Schur, Share headquarters, Chicago, Ill. (312) 822-0932.

ACM Computer Science Conference. Kansas City, Mo., March 1-7 — Contact: Don Nowak, ACM headquarters, New York, N.Y. (212) 869-7440, ext. 223.

10th Annual Computer-based Training Conference & Exposition. Orlando, Fla., March 2-5 — Contact: The Conference Department, Weingarten Publications, Inc., Boston, Mass. (617) 542-0146.

13th Annual Conference on IS Performance/Capacity Management. Scottsdale, Ariz., March 2-6 — Contact: Applied Computer Research, Inc., Phoenix, Ariz. (602) 995-5929.

Re-engineering: The Implementation Perspective. Cambridge, Mass., March 3-5 — Contact: Hammer & Co., Cambridge, Mass. (617) 354-5555.

Unix & Open Systems. Toronto, March 4-5 — Contact: Kal Juman, Datapro Canada, North York, Ontario (416) 496-3131.

Computers in Libraries. Washington, D.C., March 4-7 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

Directions '92: IDC's 27th Annual Computer Industry Briefing Session. San Jose, Calif., March 5 — Contact: International Data Corp., Framingham, Mass. (508) 872-8200.

MARCH 8 - 14

The CIO Perspectives Series — The Business of IT: Finding the Payoff. San Diego, March 8-11 — Contact: CIO magazine, Framingham, Mass. (508) 935-4631.

EDP Audit Managers Roundup XIII, Electronic Data Processing. Orlando, Fla., March 9-11 — Contact: Pam Bissett, Michael I. Sobol, MIS Training Institute, Framingham, Mass. (508) 879-7999.

CAD & Engineering Workstations '92 and Business Graphics. Anaheim, Calif., March 9-12 — Contact: National Computer Graphics Association, Fairfax, Va. (703) 698-9600.

Getting Maximum Business Value From Technology. New York, March 10-11 — Contact: The Conference Board, Inc., New York, N.Y. (212) 339-0290.

International Software Exchange '92. San Francisco, March 10-11 — Contact: Brian Eck, Juran Institute, Inc., Wilton, Conn. (203) 834-1700.

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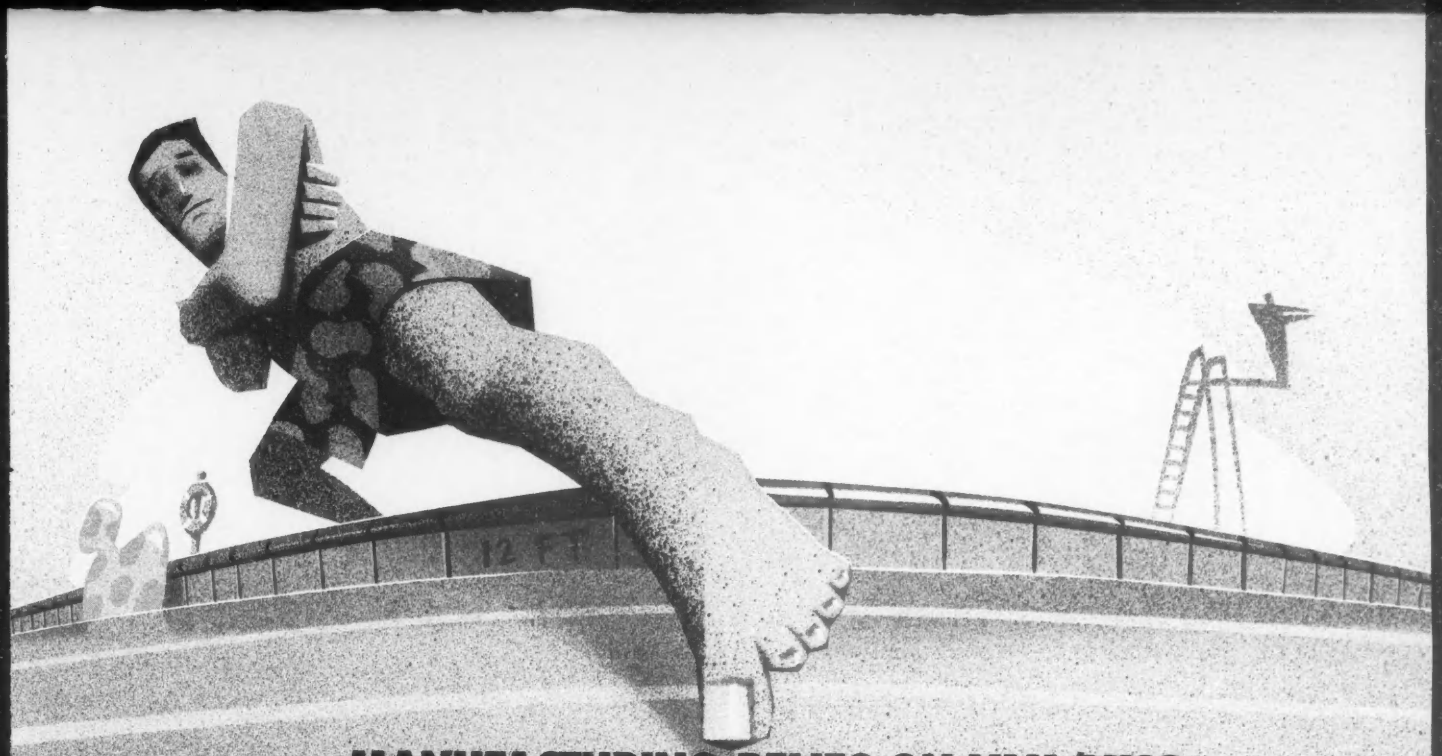
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New technology can seem a little intimidating.

Recently a leading computer industry publication reported some frightening statistics.

While investments in information technology have reached 40% of U.S. capital spending, national productivity has not improved since 1973. Which is why the anxiety over new spending is justifiable, even healthy.

The evidence indicates that information technology alone doesn't pay off. Maybe it's time to recognize that hardware companies sell hardware. Period.

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BOOK REVIEWS

'Understanding' expert tackles instructions

Follow the Yellow Brick Road: Learning to Give, Take and Use Instructions
By Richard Saul Wurman
Bantam Books, $24.95

At the root of innumerable business problems and management headaches is the same difficulty that faced Cool Hand Luke: "What we have here is a failure to communicate."

That is the premise of Richard Saul Wurman's *Follow the Yellow Brick Road*, the second book of a trilogy that began with the best selling *Information Anxiety* in 1990. Like its predecessor, *Brick Road* is unconventional, thought-provoking and humorous, and it is relevant to today's management challenges.

Wurman, a sort of Renaissance man of the '90s, has made a career of being an "understanding expert." The author of 16 Access Travel Guides and two dozen other titles, Wurman specializes in blasting apart conventional information formats and replacing them with models that are closer to the way people really think and act.

Wurman's USAtlas, for example, is organized not by states in alphabetical order, but by contiguous 250-mile squares — the average daily mileage on a long auto trip. Why should a driver have to turn almost 50 pages when crossing from Arkansas into Texas?



In *Follow the Yellow Brick Road*, Wurman challenges traditional instruction forms with the same raised-eyebrow skepticism. He believes the act of listening to or reading intructions has been given a bad name, thanks to the fear of failure instilled in us at an early age, a society that rewards talkers more than listeners and because most instructions — whether the directions to Grandma's house or a software user manual — are poorly written or communicated.

What's the solution? In a chapter titled "Instruction Construction 101," Wurman offers a six-part framework for any instruction: mission, destination, procedure, time, anticipation and what to do in case of failure. One might challenge his framework, but Wurman certainly provokes a debate about how information can best be understood.

Wurman notes that 94% of a U.S. executive's time is spent in communications-related activities. The need to train an increasingly diverse and often poorly educated work force, combined with the demands of the information-based economy, make clearer communications critical to any organization's success.

Information Anxiety readers may notice that Wurman covers much of the same ground he did in his earlier book. But his style is so engaging that the repetitiveness is not boring. At times, the book is like witty cocktail party banter, complete with anecdotes and quotes tucked in the margins. Without intimidating, Wurman provokes different ways of thinking about information and the way it is communicated. Whether you are writing a layoff memo, hashing out application specifications or exhorting your Little League team, that is a valuable exercise.

CLINTON WILDER

Winning at Technological Innovation
By Robert Englert
McGraw-Hill Publishing Co., $34.95

New products and services are often sparked by imagination and creativity, but the companies that have a consistent track record of innovation do not wait for inspiration to strike. They know how to manage innovation, Englert says.

The book is a practical guide intended to help corporate managers maintain a consistent and vigorous level of technical innovation. It contains numerous guidelines such as the six key stages in the innovation process and how to manage each one and how to foster creativity in technical staff members.

There are two types of management skills needed for successful research and development, he says: results management skills for getting the job done and influence management skills for garnering the companywide commitment that is vital to research programs.

The hard truth about innovation is that it depends on many people carrying out many different activities, Englert notes. The corporation's attitude toward innovation and whether its management's style fosters collaboration will determine how a technical manager should proceed.

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Part-time arrangements are a tough sell

BY ALICE LAPLANTE
SPECIAL TO CW

Many 9-to-5 workers dream of it: working until lunch and then having the rest of the day free to spend more time with family, go back to school or start a business.

The benefit of a *permanent* part-time relationship with a company — unlike contract technical work — is the measure of security and stability built into the employment picture. Unfortunately, in the information systems world, "permanent" and "part-time" rarely converge.

"You'll see an increase in contract temporary work long before you'll see a company looking for a permanent part-timer," says Louis LaPierre, managing partner and owner of Romac & Associates, a technical recruiting firm in Portland, Maine.

No clock-watching

The harsh reality is that most organizations flatly refuse to hire part-time IS professionals. They argue that such positions require employees to be available beyond normal working hours. Thus, an employee who watches the clock and always leaves when his allotted time is up is unacceptable to many employers.

"Our IS projects take a lot of time and commitment," notes Richard Livesey, vice president of administrative services at Gleaner Life Insurance Society in Adrian, Mich.

Part-time workers are also rare in IS because programmers support a specific system — for example, accounts payable, LaPierre says. If the system goes down when a part-timer is not around, the company suffers.



Part-time hours are more practical for positions involving data entry, routine and highly predictable systems operations and scheduled help desk or support functions.

Eric Hollenbach, director of MIS at Lucas Aerospace in Cleveland, hires part-timers for data-entry positions and technical support of operating systems.

Recruiters and IS managers say most permanent part-time agreements occur when a highly valued employee is offered a special arrangement as an alternative to leaving.

For example, Borg Warner Corp. in Chicago made a special part-time arrangement to keep an employee in a personal computer maintenance position. However, Steve Derry, manager of technical support, says that was an unusual situation.

"Typically, we either hire full-time or we burden the existing employees with additional work," he says. "Hiring a permanent part-timer isn't usually an option."

Realtec, Inc. in Atlanta took a similar tack, says Ernesto Espinal, IS director.

"The costs of training a new employee and waiting until he or she became productive were just too high," Espinal says. He found that retaining an employee on a part-time basis was a more cost-effective solution.

Sometimes, in tough economic times, it is easier to get funding approved for a part-time position than for a full-time one.

Frank Herriott, director of computer services at Westminster College in Salt Lake City, found this to be the case at his organization. Last year, he was granted funds for a part-time position that was later upgraded to full time. "Sometimes you need to compromise at first in order to get what you want," he says.

Other concerns

Lack of commitment of part-timers can also be a major concern for IS managers, as is a lack of control.

"If a part-timer tells you he is going on vacation for three weeks, there isn't much you can do about it," Hollenbach says. Of course, he adds, you can get part-time workers to sign contracts or other legally binding documents, but "generally, if they want out, they get out."

If that happens, a company could lose a major investment in training, IS managers say, noting that the cost of training part- and full-time workers is about the same.

Companies are not the only ones losing out, however; there are significant disadvantages to part-time IS work for employees:

- Greatly reduced take-home pay.
- Rare medical or retirement benefits.
- Less interesting job tasks or responsibilities.
- Lack of a viable career track.
- Less job security than full-time workers.

Still, for IS workers seeking an alternative career path, part-timing can be worth it. Part-timers are generally building a lifestyle they like, and that can make them content and productive employees.

"These people tend to be highly motivated," says David Pinkus, manager of MIS at Fuller Co. in Lehigh Valley, Pa.

LaPlante is a free-lance writer based in Palo Alto, Calif.

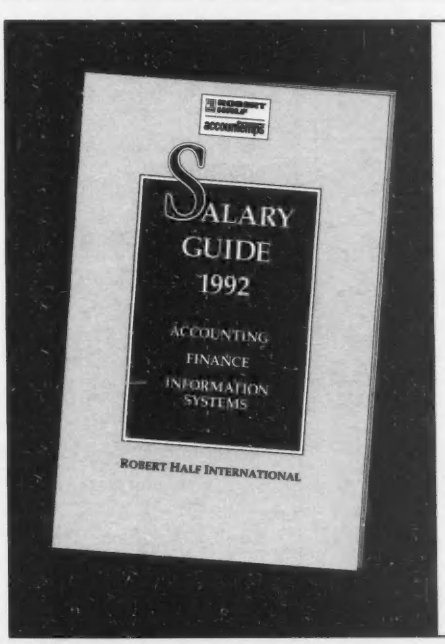
Divvying up the duties

One increasingly common part-time situation is job-sharing: Two employees work part-time, sharing what would otherwise be one full-time position.

"These are usually women who have just had children and want to stay at home part of the week but still want to maintain their job and a relationship with their company," says Jim Appleyard, manager of information security services at Duke Power Co. in Charlotte, N.C.

The benefits to a company are threefold, Appleyard says: First, because part-time employees do not receive benefits, actual employment costs are less; second, because retained employees do not need to be trained, the company's investment in expertise is protected; third, because most new parents eventually return to work full time, the company has managed to keep valuable employees.

ALICE LAPLANTE



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Imaging know-how opens doors

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Max Messmer, chairman of Robert Half International, Inc., which places IS professionals in the U.S. and abroad.

Q I have spent the last 10 years working for hardware and software vendors in technical support and project management. Now I'd like to get out of the vendor world and work at either a large company in an internal consulting capacity or at a large consulting firm.

I've worked with a variety of hardware and software platforms and on a number of large-scale systems integration projects involving both wide-area and local-area networking. I'm experienced in office automation, document management, imaging, electronic publishing and database management.

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A You may find systems or management consulting opportunities at large or midsize public accounting firms. In addition, many large law, financial and insurance firms that distribute and process millions of documents are seeking individuals with imaging experience.

Q My educational background (a bachelor's degree in electrical engineering and a master's degree in computer science) and my experience profile lead most prospective employers to conclude that I'm an engineer who knows how to program.

I'm not. I'm a programmer who happens to have an engineering degree. How can I convince organizations I'm interviewing with that I'm interested in nonengineering work?

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A If your experience profile is misleading, rewording your resume to stress such areas as applications development, structured methodology, systems analysis and hardware/software knowledge will help you find nonengineering work.

If you are interested in working for a software or tool developer, emphasize design, testing and quality-assurance skills and highlight your ability to work with "low-level" code and details.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q As a systems programmer in an IBM mainframe environment, I am reaching the highest salary normally being paid for these positions. What career path is available to me? I am not interested in "off" hours and weekend work or in the "red tape" and "office politics" of management.

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A If you are at the top of your salary range and aren't interested in management, your best course may be to identify companies whose programmers work with multiple operating systems, multiple communications software programs or multiple databases. These kinds of programming positions generally pay more.

If, for example, you are an MVS systems programmer, you may want to look for a job that will give you an opportunity to learn and work with the VM or Unix operating systems. It would also be wise to seek opportunities to work with midrange and microcomputer systems.

Q I am currently an IBM mainframe operator and would like to advance into Cobol or assembler programming. However, even with a four-year degree in computer science, I'm finding that many companies, including my current employer, won't give me a chance to make that move. They say they require two-plus years of experience.

K.B.
Chicago, Ill.

A Even experienced Cobol and assembler programmers are having difficulty finding new employment these days, unless they have some understanding or training in advanced computing and networking. This is because so many companies are embracing microcomputer cooperative processing, LANs, fourth-generation languages and relational databases. You may want to consider completing a certificate or taking courses in those areas.

We welcome your questions. Send them to Kelly Dwyer, Careers Fast Track, Computerworld, *375 Cochituate Road, Framingham, Mass. 01701, or fax them to (508) 875-8931. Letters may be edited for brevity and clarity. Your initials and town will be printed unless you request otherwise.*

JOB SNAPSHOT

Communications specialist

Job Snapshot is a monthly column that provides detailed information on selected job categories.

▶**JOB REQUIREMENTS:** On-the-job experience in the appropriate environment is the most sought-after credential, communications specialists say. Employers are also putting increased emphasis on familiarity with both personal computer and mainframe protocols and knowledge of leading technologies and standards such as electronic data interchange.

▶**JOB SKILLS:** Communications specialists must be able to adjust to change quickly and keep several balls in the air at the same time. At a big company with a large communications department, you may get the opportunity to specialize, but most companies don't allow you that luxury.

▶**EDUCATION REQUIREMENTS:** A computer science degree is the standard requirement, although other disciplines that encompass communications theory, such as systems engineering, are also attractive. A sound background in business, systems and technology analysis, quality assurance engineering and financial and cost accounting is recommended.

▶**CAREER PLUSES:** With requirements and technologies changing all the time, this is not a job that's likely to be dull. There is, however, a fairly high degree of security because the need for connections between sites and platforms is rising.

▶**CAREER MINUSES:** If you can't handle change, long hours and stress, then you shouldn't enter this field. Things rarely stay the same for more than six months, one specialist says. You also sometimes spend considerable effort on high-risk projects that don't pan out.

▶**SALARY ESTIMATES:** *Computerworld*'s 1991 salary survey put the average annual wage for communications specialists at $38,333, with the highest regional salaries in Northern California ($51,818) and the lowest regional salaries in Arizona ($31,313). Mining/construction and banking/securities ranked as the highest paying industries, with average salaries in the mid- to high $40s, while insurance, education and health care typically offer salaries in the low $30s.

▶**REAL WORLD ADVICE:** Work on upgrading your skill set, filling in any gaps in platform knowledge. LAN training is a must. You need a solid understanding of how mainframes and PC networks work and what terminals and terminal emulation packages do. You will also need a good grasp of diagnostic capabilities for ferreting out problems.

Researched and written by Kathleen Gow, a free-lance writer based in Medford, Mass.

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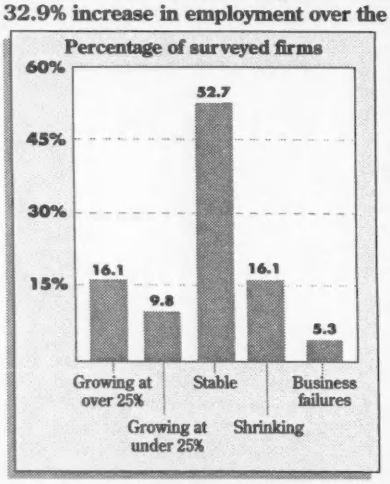
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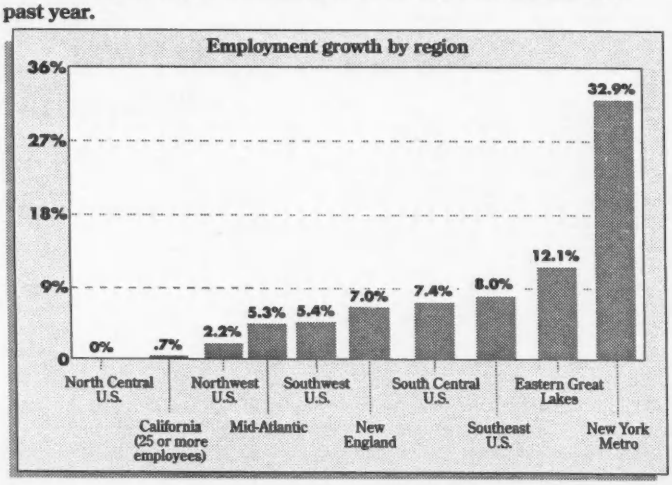
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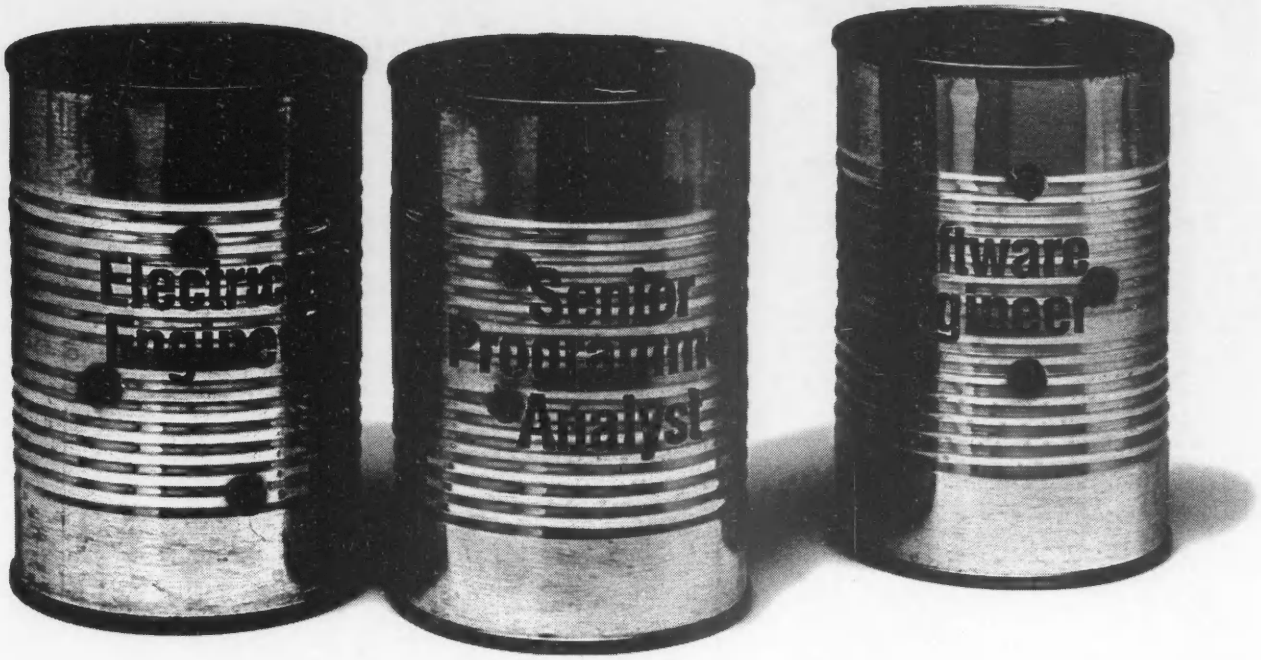
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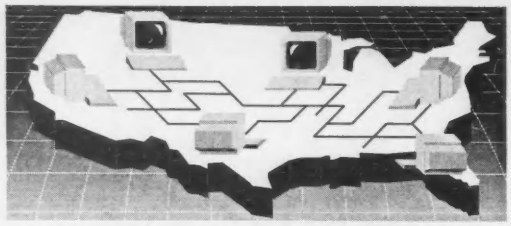
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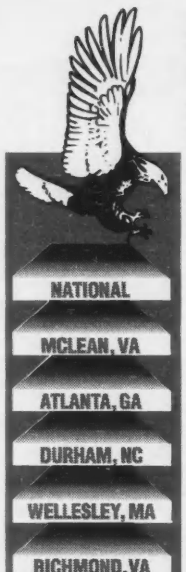
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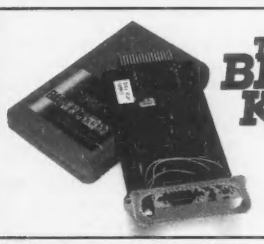
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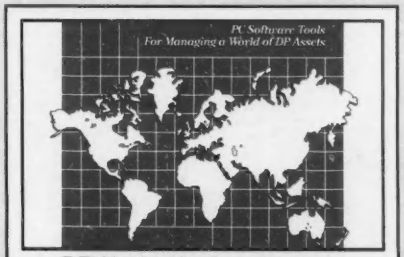


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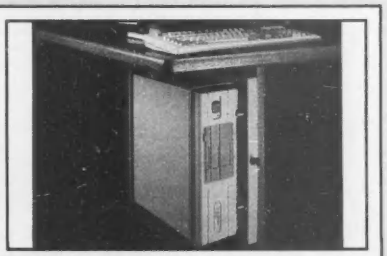
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Add-on options plentiful for workgroup laser printers

BY EMILY LEINFUSS
SPECIAL TO CW

The buying guidelines used for an individual's last laser printer purchase may not work when selecting a printer to be shared by a business department.

Designed to be used by several people, workgroup printers should have higher printing speeds of 6 page/min, increased paper-handling capabilities and better print quality. Lower-level lasers that run at speeds of 4 page/min to 6 page/min and have fewer paper options are more suited for one person.

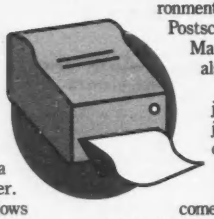
Laser printers for workgroup settings — 10 to 12 employees — that feature speeds ranging from 6 page/min to 11 page/min include Hewlett-Packard Co.'s Laserjet III and Laserjet IIID, Lexmark International, Inc.'s 4029 series Laserprinters, Apple Computer, Inc.'s Laserwriter IIF and Laserwriter IIG, Okidata Corp.'s OL-800 series, Panasonic Communications & Systems Co.'s KX-P4400 series machines and Canon USA, Inc.'s LBP-Mark series. Each of these printers is priced between $2,000 and $5,000.

Options abound

When choosing a laser printer for a workgroup, users need to consider the printer's reliability most of all, says Jeremiah Caron, senior group editor at Faulkner Information Services, Inc. in Pennsauken, N.J.

However, there are other features to consider. When differentiating between laser printers for workgroup computing, especially those in a shared environment and stand-alone lasers, buyers should ask about the the following:

• **Resolution enhancement capabilities.** Workgroup laser printers should come with some form of resolution enhancement. HP calls it Resolution Enhancement Technology and IBM has Print Quality Enhancement Technology.



Whatever the name, resolution enhancement is what differentiates these machines from a lower level of printer. This technology allows the printers to offer clearer, crisper text and graphics than cheaper printers do. Because the difference in print quality will be noticeable, buyers should see sample prints.

• **PDL support.** As mentioned, above, one of the more important choices in buying a laser printer is which page description language or languages (PDL) the machine can support. PDLs are incorporated into the printer's controller and determine both performance and compatibility with applications software.

The more advanced PDLs allow printing of scalable fonts, which are typefaces that can be reduced or enlarged, as opposed to bitmapped typefaces — which the machines also offer — that can only be printed in 10-point and 12-point type size.

All of the laser printers in this market offer at least one major PDL as standard and others as options. Sometimes, the ability to switch between major PDLs — such as HP's PCL4, a bitmap type, PCL5, which has HP's scalable fonts, and Adobe Systems Inc.'s Postscript in the DOS environment — is offered; Postscript in the Apple Macintosh world is also important.

The HP Laserjet III and Laserjet IIID , which cost $2,395 and $3,595 respectively, both come standard with PCL5; the IIID also can be bundled with Postscript. The machines come standard with eight scalable typefaces and 14 bitmapped fonts.

Laserprinters Models 10 ($2,395) and 10N ($2,995) from Lexmark, an IBM alliance company, come with personal printer data stream, IBM's scalable font language and PCL4 standard; PCL5 and Postscript are add-on options. The Laserprinters come standard with 16 Adobe Type 1 scalable typefaces and 10 bitmapped fonts.

Most workgroup users need to be compatible with PCL5 or Postscript because they are de facto standards.

"Users want the printer to be compatible with all the applications they might use," says Marc Boer, senior market analyst at BIS Strategic Decisions in Norwell, Mass.

• **Extensive paper-handling capabilities.** Workgroup laser printers should also be able to handle an input capacity of at least 200 sheets and a range of paper sizes, including 8½-in. by 11-in. and 11-in. by 17-in. paper and envelopes. If not standard, they should be available through paper tray options.

Both the HP and the Lexmark machines come standard with two 8½-in. by 11-in. paper trays and a number of paper tray options. However, the Lexmark machine's second paper tray holds 500 sheets and offers an added feature as standard: an output bin that stops the machine from printing more than 250 sheets, making sure the printer tray doesn't overflow onto the floor when receiving commands from a number of CPUs.

• **Networking alternatives.** Since workgroup computing often involves a local-area network, it is important to check out what networking options are available.

The Lexmark Laserprinter 10L was specially designed to work more effectively in a LAN environment. It uses a device that allows printers to be directly connected to an IBM Token Ring or Ethernet network without a dedicated printer server.

HP also allows users to connect printers directly into a personal computer LAN, through the use of printer interface cards designed for Ethernet or Token Ring networks. These cards are add-on options.

• **Upgradability.** This is a crucial component to any laser printer because user needs are constantly expanding. All of the workgroup laser printers offer the ability to add memory, PDLs, extra fonts and typefaces, alternative paper trays and networking connections.

BECAUSE THE DIFFERENCE in print quality will be noticeable, buyers should see sample prints for themselves.

If a group of users decides to start printing a newsletter, an upgrade to a higher print quality — more than 500 dot/in. — will be needed. Because most of these machines come standard with 300 dot/in., this move will probably require upgrading to Postscript, which also means adding memory to the standard 1M byte these machines already offer.

An add-on Postscript cartridge costs about $500, while the memory upgrade can cost from $200 to $800, depending on how much is added. Similarly, font cards cost about $400, paper trays can cost from $69 to $300, and network cards are priced from $600 to $900. These options can all be added as needed.

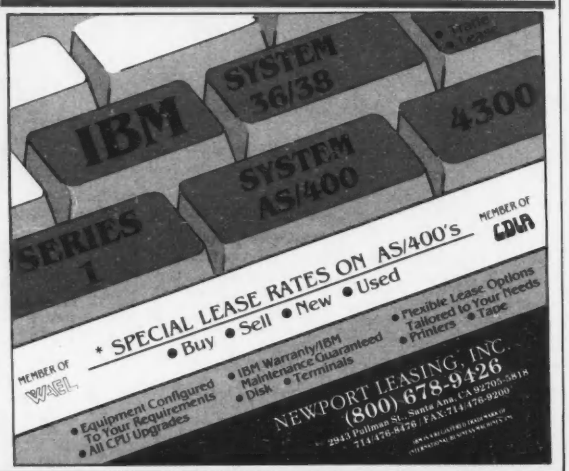
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General RFP No. 2140 due Thurs, 3/5/92, at 3:30 p.m. This is a General RFP to be used through March 1993 for the acquisition of microcomputer-based systems, peripherals and software for the State of Mississippi.

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PS/2 Model 60	$700	$900	$600
PS/2 Model 80	$2,050	$2,100	$2,000
PS/2 Model 90	$4,300	$4,600	$4,100
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INDUSTRY ALMANAC

Network ratings

Current investment advice on communications stocks

Company	Montgomery Securities, Inc.	Shearson Lehman Brothers, Inc.
Chipcom Corp.	Outperform	Not rated
Cisco Systems, Inc.	Not rated	Neutral
Compression Labs, Inc.	Not rated	Outperform
Lannet Data Communi-cations	Not rated	Outperform
Novell, Inc.	Aggressive buy	Outperform
Synoptics Communi-cations, Inc.	Not rated	Buy
3Com Corp.	Not rated	Buy

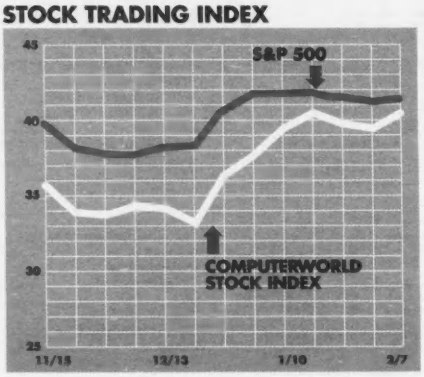
Service ratings

Company	Alex. Brown & Sons, Inc.	Mabon Securities Corp.
American Management Systems, Inc.	Buy	Neutral
Computer Sciences Corp.	Buy	Attractive
Electronic Data Systems Corp.	Buy	Attractive
Policy Management Systems Corp.	Buy	Neutral
Sunguard Data Systems, Inc.	Buy	Neutral

Software ratings

Company	Donaldson, Lufkin and Jenrette Securities Corp.	Shearson Lehman Brothers, Inc.
Adobe Systems, Inc.	Not rated	Buy
Borland International, Inc.	Neutral	Neutral
Computer Associates International, Inc.	Moderately attractive	Neutral
Informix Corp.	Neutral	Neutral
Lotus Development Corp.	Neutral	Outperform
Mentor Graphics	Buy	Not rated
Microsoft Corp.	Moderately attractive	Outperform
Software Publishing Corp.	Neutral	Neutral

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Gainers included Microsoft Corp., which picked up 2¾ points to 126¼. Microsoft ousted President Michael Hallman in favor of three co-presidents. Novell, Inc. stepped up 3 points last week to close Thursday at 60¼.
- Apple Computer, Inc. and Dell Computer Corp. each added ⅜ of a point last week, closing at 64½ and 32⅜, respectively. Both firms cut personal computer prices.
- Elsewhere, Amdahl Corp. jumped 2½ points — about 15% — to 19¼. Unisys Corp. gained ⅜ of a point to 8⅛. Bear, Stearns & Co. recently upgraded Unisys from avoid to hold.
- Among semiconductor stocks, Intel Corp. advanced 1¾ points to 62¾, National Semiconductor Corp. climbed 1½ to 9½, and Advanced Micro Devices, Inc. inched up ⅞ of a point to 20⅛.
- Peripherals maker Quantum Corp. gained 1¾ points to 16¾, and rival Seagate Technology, Inc. added ½ a point to close Thursday at 13⅝.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, FEBRUARY 7, 1992

TOP PERCENT GAINERS

National Semiconductor	24.59
IPL Systems Inc.	21.21
Aicorp	18.07
Cambex Corp.	16.88
Pyramid Technology	15.25

TOP PERCENT LOSERS

Ultimate Corp.	-16.00
Data Switch Corp.	-12.24
Network Systems Corp.	-9.77
Apertus Technologies	-9.09
Computer Automation Inc.	-9.09

TOP DOLLAR GAINERS

Cambex Corp.	6.50
Microsoft Corp.	5.50
IPL Systems Inc.	5.25
Picturetel Corp.	5.25
Intel Corp.	4.63

TOP DOLLAR LOSERS

Eastman Kodak Co.	-3.63
American Info Techs Corp.	-2.50
Autodesk Inc.	-2.13
Bellsouth Corp.	-2.00
Bell Atlantic Corp.	-1.63

Exch	52-Week		Range	Feb. 7 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						**Up 0.54%**
OTC	14.13	6.75	3 COM Corp.	14.13	1.38	10.78
NYS	69.75	55.75	American Info Techs Corp.	60.25	-2.50	-3.98
NYS	41.38	31.63	AT&T	36.88	-0.38	-1.01
OTC	4.25	1.25	Artel Communication Corp.	3.88	0.00	0.00
NYS	52.75	43.00	Bell Atlantic Corp.	44.50	-1.63	-3.52
NYS	54.38	45.38	Bellsouth Corp.	47.25	-2.00	-4.06
NYS	63.25	30.25	Cabletron Systems	63.25	3.63	6.08
OTC	35.25	13.75	Compression Labs Inc.	27.25	0.38	1.40
OTC	5.13	1.50	Data Switch Corp.	2.69	-0.38	-12.24
NYS	23.63	12.38	Digital Comm. Assoc.	22.25	-0.63	-2.73
OTC	25.25	14.00	Dynatech Corp.	21.50	0.25	1.18
OTC	12.38	5.00	Fibronix Int'l Inc.	8.50	-0.75	-8.11
OTC	29.75	10.50	FileNet Corp.	28.50	1.50	5.56
OTC	3.75	1.13	Gandalf Technologies Inc.	2.38	0.00	0.00
NYS	4.00	2.13	General Datacomm Inds.	3.88	0.13	3.33
NYS	35.00	28.13	GTE Corp.	31.00	-0.50	-1.59
NYS	63.00	50.00	ITT Corp.	58.75	0.75	1.29
OTC	35.00	24.63	MCI Commmunications Corp.	32.88	1.50	4.78
OTC	14.50	4.75	Microcom Inc.	11.50	1.38	13.58
NYS	18.13	5.13	Network Equipment Tech.	17.13	0.38	2.24
OTC	25.50	6.75	Network General	24.75	1.50	6.45
OTC	20.00	10.50	Network Systems Corp.	15.00	-1.63	-9.77
NYS	49.13	28.63	Northern Telecom Ltd.	46.50	-0.25	-0.53
OTC	65.00	22.50	Novell Inc.	60.50	2.25	3.86
NYS	82.38	68.00	Nynex Corp.	74.25	-0.75	-1.00
NYS	46.75	38.50	Pacific Telesis Group	41.13	-1.50	-3.52
OTC	11.63	5.63	Penril Data Comm. Ntwks.	9.13	0.25	2.82
OTC	50.75	16.75	Picturetel Corp.	50.00	5.25	11.73
NYS	18.75	11.63	Scientific Atlanta Inc.	18.75	1.13	6.38
NYS	66.00	49.00	Southwestern Bell Corp.	58.75	-1.63	-2.69
NYS	31.50	21.25	United Telecom	22.50	-1.50	-6.25
NYS	40.75	33.75	US West Inc.	35.25	-1.38	-3.75
Computer Systems						**Up 2.04%**
OTC	20.75	6.75	Advanced Logic Research	8.00	-0.50	-5.88
ASE	19.38	11.63	Amdahl Corp.	19.25	1.50	8.45
OTC	73.25	40.25	Apple Computer Inc.	64.00	-0.75	-1.16
OTC	9.13	2.75	Archive Corp.	5.63	0.25	4.65
OTC	32.75	14.50	AST Research Inc.	20.50	0.00	0.00
NYS	9.38	4.75	Bolt, Beranek & Newman	5.50	-0.13	-2.22
NYS	21.63	10.13	Commodore Int'l	15.00	-0.38	-2.44
NYS	74.25	22.13	Compaq Computer Corp.	30.13	0.25	0.84
OTC	2.63	0.88	Computer Automation Inc.	1.25	-0.13	-9.09
NYS	13.38	7.50	Control Data Corp.	11.75	-0.13	-1.05
NYS	19.75	8.88	Convex Computer	16.13	1.25	8.40
NYS	52.25	31.50	Cray Research Inc.	42.13	0.38	0.90
NYS	22.50	8.50	Data General Corp.	11.75	0.25	2.17
NYS	4.38	1.00	Datapoint Corp.	3.00	0.38	14.29
OTC	36.25	20.25	Dell Computer Corp	32.13	0.25	0.78
NYS	83.00	48.50	Digital Equipment Corp.	53.38	3.00	5.96
NYS	30.75	21.25	Harris Corp.	28.50	0.75	2.70
NYS	63.38	36.63	Hewlett Packard Co.	62.50	3.25	5.49
NYS	139.75	83.50	IBM	89.13	-1.00	-1.11
OTC	12.00	6.50	Information Int'l	9.25	-0.25	-2.63
NYS	145.75	105.00	Matsushita Electronics	116.50	-1.25	-1.06
OTC	20.88	7.88	MIPS Computer Systems	11.50	-0.75	-6.12
OTC	29.50	10.75	Pyramid Technology	17.00	2.25	15.25
OTC	19.75	7.50	Sequent Computer Sys.	17.13	0.75	4.58
NYS	54.00	26.50	Silicon Graphics	52.38	2.13	4.23
NYS	51.50	27.00	Stratus Computer Inc.	49.63	2.25	4.75
OTC	38.63	20.75	Sun Microsystems Inc.	33.13	2.63	8.61
NYS	17.63	9.50	Tandem Computers Inc.	13.38	0.13	0.94
OTC	4.75	1.25	Tandon Corp.	2.00	0.06	3.20
NYS	36.50	23.38	Tandy Corp.	26.88	2.50	10.26
OTC	32.38	12.50	Teradata	30.00	0.00	0.00
NYS	6.13	1.13	Ultimate Corp.	2.63	-0.50	-16.00
NYS	8.75	3.25	Unisys Corp.	8.13	0.63	8.33
ASE	5.75	2.00	Wang Labs Inc. (b)	3.75	0.13	3.45
Software & DP Services						**Up 3.53%**
OTC	68.50	41.25	Adobe Systems Inc.	62.75	1.38	2.24
OTC	12.25	3.50	Aicorp	12.25	1.88	18.07
OTC	59.88	28.75	Aldus Corp.	33.75	1.25	3.85
OTC	28.50	16.25	American Mgmt. Systems	23.25	0.50	2.20
OTC	17.75	9.00	American Software Inc.	17.50	0.25	1.45
NYS	5.38	2.50	Anacomp Inc.	4.75	0.00	0.00
OTC	18.25	12.00	Analysts Int'l	17.00	0.25	1.49
OTC	18.88	6.25	ASK Computer Sys.	18.88	0.75	4.14
NYS	49.00	29.50	Auto Data Processing	45.88	3.13	7.31
OTC	82.25	24.88	Autodesk Inc.	26.13	-2.13	-7.52
OTC	42.50	25.88	BGS Systems Inc.	42.50	2.50	6.25
OTC	79.00	33.00	BMC Software Inc.	68.25	1.50	2.25
OTC	16.25	8.75	Boole & Babbage Inc.	16.75	0.00	0.00
OTC	86.75	39.50	Borland Int'l	77.00	1.00	1.32
OTC	20.88	7.50	Cognos Inc.	10.00	-0.50	-4.76
NYS	15.88	7.25	Computer Associates	15.88	1.13	7.63
OTC	15.50	7.75	Computer Horizons	12.75	1.25	10.87
NYS	82.75	52.25	Computer Sciences	79.75	0.75	0.95
NYS	11.25	7.00	Computer Task Group	8.75	0.13	1.45
OTC	22.75	12.00	Comshare inc.	16.00	1.63	11.30
OTC	17.00	7.00	Corporate Software	17.00	1.00	6.25
NYS	66.13	39.25	General Motors E (EDS)	61.13	3.75	6.54
OTC	18.75	9.25	Goal Systems Int'l	13.00	0.25	1.96
OTC	7.00	3.38	Hogan Systems Inc.	5.88	-0.38	-6.00
OTC	35.00	14.75	Information Resources	32.75	0.50	1.55
OTC	27.75	4.38	Informix Corp.	27.75	3.25	13.27
OTC	3.63	1.06	Intellicorp Inc.	2.13	0.19	9.65
OTC	31.50	16.25	Intergraph	19.25	-0.50	-2.53
OTC	13.38	4.75	Interleaf Inc.	13.13	0.38	2.94
OTC	20.25	7.38	Intersolv	19.00	1.25	7.04
OTC	43.25	10.50	Knowledgeware Inc.	20.25	0.00	0.00
OTC	45.00	20.25	Legent Corp.	42.25	0.88	2.11
OTC	40.75	18.00	Lotus Development	32.75	-0.88	-2.60
OTC	19.88	11.50	Mentor Graphics	19.88	1.25	6.71
OTC	32.00	9.75	Micrografx	28.50	2.50	9.62
OTC	133.25	60.50	Microsoft Corp.	125.75	5.50	4.57
OTC	20.13	7.00	Oracle Systems	19.63	1.13	6.08
OTC	10.00	4.88	Phoenix Technologies	8.75	0.88	11.11
OTC	25.25	9.00	Platinum Technology	22.00	1.75	8.64
NYS	72.75	43.25	Policy Management Sys.	70.50	2.38	3.49
NYS	40.00	17.13	Reynolds & Reynolds	39.75	0.88	2.25
OTC	16.75	6.75	Ross Systems	14.75	0.25	1.72
OTC	31.50	21.25	SEI Corp.	30.50	0.25	0.83
OTC	24.13	15.63	Shared Medical Systems	22.63	-0.63	-2.69
OTC	35.25	12.50	Software Publishing Corp.	23.63	2.38	11.18
NYS	24.88	10.00	Sterling Software	23.50	1.75	8.05
OTC	21.75	11.75	Sungard Data Sys.	21.75	1.25	6.10
OTC	51.00	19.50	Symantec Corp.	46.25	1.25	2.78
NYS	15.50	4.88	System Center Inc.	11.63	-0.75	-6.06
OTC	26.50	8.34	System Software Assoc.	26.00	0.50	1.96
Semiconductors						**Up 3.77%**
NYS	21.38	7.25	Advanced Micro Devices	20.25	1.38	7.28
NYS	12.50	7.00	Analog Devices Inc.	9.38	-0.75	-7.41
OTC	13.50	7.00	Chips & Technologies	11.38	1.38	13.75
NYS	64.50	38.50	Intel Corp.	64.50	4.63	7.72
NYS	12.50	6.50	LSI Logic Corp.	9.00	0.13	1.41
NYS	20.00	10.88	Micron Technology	19.25	0.63	3.36
NYS	80.13	54.00	Motorola Inc.	80.13	3.50	4.57
NYS	9.50	3.88	National Semiconductor	9.50	1.88	24.59
NYS	47.63	26.00	Texas Instruments	34.50	-1.25	-3.50
OTC	12.25	5.88	VLSI Technology	9.00	0.38	4.35
OTC	16.75	4.50	Weitek	5.75	-0.50	-8.00
ASE	6.25	2.00	Western Digital Corp.	4.13	-0.13	-2.94
Peripherals & Subsystems						**Up 3.14%**
OTC	2.75	1.00	Apertus Technologies	1.25	-0.13	-9.09
OTC	19.50	9.50	Banctec Inc.	19.00	1.00	5.56
OTC	45.00	9.38	Cambex Corp.	45.00	6.50	16.88
ASE	11.75	7.00	Cognitronics Corp.	9.75	-0.25	-2.50
NYS	29.25	12.50	Conner Peripherals	19.75	0.63	3.27
ASE	25.63	9.63	Dataram Corp.	25.50	3.25	14.61
NYS	16.50	4.88	EMC Corp.	15.88	0.25	1.60
NYS	50.75	38.63	Eastman Kodak Co.	46.88	-3.63	-7.18
OTC	11.25	4.75	Emulex Corp.	6.38	0.25	4.08
OTC	24.00	14.75	Evans & Sutherland	20.25	0.50	2.53
OTC	10.25	4.00	Iomega Corp.	10.25	0.38	3.80
OTC	30.00	14.50	IPL Systems Inc.	30.00	5.25	21.21
OTC	8.75	1.63	Maxtor Corp.	8.75	0.00	0.00
OTC	18.00	5.50	Micropolis Corp.	10.25	0.13	1.23
NYS	98.75	83.50	3M Corp	91.00	0.00	0.00
OTC	10.75	3.50	Printronix Inc.	4.75	0.38	8.57
NYS	26.75	11.25	QMS Inc.	14.38	-0.25	-1.71
OTC	18.25	8.88	Quantum Corp.	16.25	1.13	7.44
NYS	11.00	5.13	Recognition Equipment	10.13	-0.25	-2.41
OTC	11.50	5.38	Rexon Inc.	10.38	0.25	2.47
OTC	19.88	7.13	Seagate Technology	13.88	1.00	7.77
NYS	77.38	26.25	Storage Technology	75.00	0.50	0.67
NYS	30.88	16.00	Tektronix Inc.	19.50	-0.38	-1.89
OTC	0.53	0.16	Televideo Systems	0.38	0.00	0.00
NYS	80.75	50.00	Xerox Corp.	80.75	3.63	4.70
Leasing Companies						**Off 0.37%**
OTC	16.25	10.50	Amplicon Inc.	12.88	-0.63	-4.63
NYS	28.38	18.13	Comdisco Inc.	20.50	0.63	3.14
OTC	16.25	11.25	LDI Corporation	14.88	0.00	0.00

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NATIONAL BRIEFS

New parent

▶ Many a firm spins off a subsidiary, but **Computer Corporation of America** last week announced the formation of a new parent company. Under the name of **Praxis International, Inc.**, the Cambridge, Mass.-based outfit will field three subsidiaries: Computer Corporation of America, Marketpulse and Segue Partners.

Leasing the future

▶ **Apple Computer, Inc.**'s USA division last week signed on with **GE Capital Computer Leasing** to launch the Apple Corporate Leasing Program. Fortune 500 firms can now lease Apple products and services through a computer leasing heavyweight that already competes with the likes of **IBM Credit Corp.** and **Comdisco, Inc.** The new program supplements the current leasing program offered by Apple and **Dana Commercial Credit.**

Faxing prophetic

▶ **Alacrity Systems, Inc.** thinks desktop users need a software product that lets a Microsoft Corp. Windows-based personal computer operate like a fax machine, a photocopier and a document storage and retrieval system. Apparently, **Edelson Technology Partners** and **Olivetti** think so, too: They recently led an investment consortium in raising $4 million to allow the start-up to support its Desktop Document Manager.

IBM's Programming Unit perseveres

BY JOHANNA AMBROSIO
CW STAFF

SOMERS, N.Y. — Despite suggestions to the contrary, IBM said its Programming Systems line of business is doing well enough to fund its own projects, including the beleaguered Repository Manager.

The unit's fate is critical in light of its role as lead coordinator of Systems Application Architecture (SAA), AD/Cycle — of which Repository Manager is a key component — Information Warehouse and more of the company's strategic long-term architectures. Because these initiatives are not immediate payback items, some watchers said, Programming Systems may be dramatically reorganized or otherwise changed around to put more emphasis on shorter term revenue goals.

Many industry analysts have recently questioned the long-term future of the Programming Systems unit, especially given IBM's reorganization, in which short-term profit goals are being stressed.

Jon Hemming, manager of market strategy at Programming Systems here, nixed that idea. Programming Systems, he said, has a "very robust" revenue stream, with products including the new versions of Cross System Product, C and Cobol doing particularly well. Other successful software products include Interactive System Productivity Facility and some of the packages that IBM is selling on behalf of its business partners.

"We're in very good shape," Hemming said, declining to provide financial details. "And unlike some other business units, we remain tightly linked with IBM field sales forces around the world."

Most observers agreed that Programming Systems seems set for the immediate future — especially given the 7,000 DB2 licenses that IBM is collecting maintenance revenue on — but they said they still wonder what will happen eventually.

"Their near-term revenue situation is fine," said James Cassell, a vice president at Gartner Group, Inc. in Stamford, Conn. "But the reorganization hurts the systems-level stuff, the projects that require coordination and cooperation among different business units, because everyone is focused on just their area. The pressure is on to either make your numbers or you are fired."

Coopers & Lybrand allies with systems integrator

BY ELISABETH HORWITT
CW STAFF

After six months of quiet negotiation, Coopers & Lybrand and Network Management, Inc. (NMI) recently announced an alliance to provide soup-to-nuts systems integration services.

NMI, a $50 million network systems integrator, presented an available expertise" in local-area network and wide-area network integration, design and management, said Phil Tiplitsky, Coopers' director of management consulting services. As users increasingly move into the client/server LAN environment, "such expertise is becoming more and more critical in what had been for five years a traditional, mainframe package," he said.

NMI wants to move beyond its specialized areas of building and managing network infrastructures and distributed environments for clients, said Francis Dramis, NMI's chairman and chief executive officer. "We see many companies that need help converting their databases, applications and business process flows" as they move to distributed platforms, he said.

Indeed, as a former chief information officer at Salomon Brothers, Inc., Dramis observed financial companies redefining the jobs of sales and customer support managers because LAN-based systems put critical applications and databases directly in the hands of these employees.



NMI's Dramis: *Firm saw an excellent fit with Coopers*

Realizing it did not have the capability to address the above issues alone, NMI saw an excellent fit with Coopers, Dramis said.

Working together, the two companies can not only tackle the technological challenges of moving to a client/server environment but also help businesses leverage their computer and networking technologies effectively in dealing with current business issues, such as globalization, Dramis said.

The companies have already begun joint client presentations, initially concentrating on business sectors where they both have a presence, Dramis said. These include the financial, government and legal sectors. In the future, the companies plan a "selective transfer of skills" that will enable them to target areas such as health care and small manufacturers, he added.

The agreement, which is initially limited to U.S. engagements, is not exclusive on either side. Both companies said they will continue to seek partners to complement their expertise in various integration areas. Coopers now uses other LAN and WAN integrators on a regional basis, Tiplitsky said.

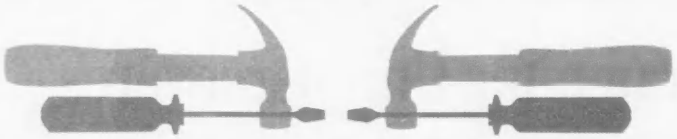
$ 9,346,153,872

By the end of this week
Computerworld readers will have spent
over **$9.3 Billion** on
Information Technology — representing nearly half of
all spending in the last seven days.

COMPUTERWORLD
The Newspaper of IS

Source: IDC Research Services, Fall 1991

TRENDS



CUSTOMER SERVICE

"Companies can expect an increased investment in technologies, tools and delivery processes by vendors attempting to meet customer expectations for quality service."

Marnie Phillips, manager, service trends program, Dataquest/Ledgeway

Worldwide revenue
(in billions)



Expanded service offerings have driven the market forward, increasing 13% from the previous year

Skill enhancement

Systems integration and professional services are among the areas in which vendors are upgrading skills to provide expanded levels of support

- Network/Communications
- Consulting
- Project management
- Software (application development)
- Unix
- Open systems architectures
- Systems integration
- Other professional services

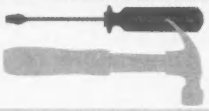
Top 10 worldwide service providers by revenue

(Systems vendors only)

IBM is heads above the rest, generating $12.4 billion in service revenue, whereas its closest competitor claimed only $4.8 billion

1990 worldwide revenue (in millions)

IBM	$12,400
DEC	$4,797
Xerox	$4,180
Unisys	$3,061
HP	$2,653
NCR	$2,610
Siemens/Nixdorf	$1,830
Groupe Bull	$1,654
AT&T	$1,522
Olivetti Systems and Networks	$1,378



Purchase decision-making

Service reputation figures into the buying process, ranking second only to product performance

1. Product performance
2. Service reputation
3. Vendor reputation
4. Product reputation
5. Trials

Source: Dataquest/Ledgeway, Framingham, Mass.

CW Chart: Tom Monahan

NEXT WEEK

The saga of Wang Labs revolves around the technical wizardry and mythic status of Chinese immigrant **An Wang**, who parlayed his ideas into a $2.2 billion firm. But it is also a story of nepotism, shortsightedness and arrogance, elements that pushed Wang Labs to the brink of bankruptcy in 1989. Read all about it in next week's In Depth.



Rick Friedman/Black Star

If you want to show some business savvy, you need to act like a businessperson — and talk like one, too. In next week's Careers section, find out the business terms every career-minded IS professional should know. And get some advice on the key business skills that IS pros should hone, as well as practical ways to go about developing those skills.

INSIDE LINES

Well-exercised option

▶ Don't weep for Microsoft President Mike Hallman, who will leave his post March 1 a very rich man, thanks to Microsoft's stock option plan and the company's incredible stock performance during his tenure. In addition to an undisclosed severance package, Hallman exercised options to buy 187,500 Microsoft shares for $37.17 a share in late October for about $7 million. He then sold 175,000 of these for $90.16 each — or $15.8 million. He kept 12,500 shares, which were worth approximately $1.6 million as of last week. Profit before taxes: $10.4 million. Even if he exercises just 15% of his remaining options, he could still make an additional $7.4 million, based on last week's stock price.

On tap

▶ DEC is making another move on the desktop this week. The company is expected to introduce expanded multivendor client/server support for transaction processing systems. This is targeted at VAX/VMS customers using DEC's Application Control and Management System (ACMS) and desktop ACMS — software products layered on VAX/VMS used to define, run and control on-line applications.

Wait 'til next time

▶ This week's IBM mainframe announcements are rumored to be "no big deal," according to one analyst who said they will likely include memory enhancements and some software-pricing alignments. But next month, IBM's answer to Storage Tek's tape library will be unveiled. According to one user who has seen the tape library, it "isn't much of a stand-alone library, but it does integrate nicely with IBM's processor family — and Systems Managed Storage software is the key."

Head to head

▶ Get ready for the battle of the trade show booths. Microsoft and IBM have increased their exhibit space for Comdex/Spring '92 by thousands of square feet from last year to promote their new desktop operating systems, according to the Interface Group. IBM has committed to 10,500 sq ft, up from only 1,600 sq ft at last year's show, and it will devote 8,000 sq ft for OS/2. Not to be outdone, Microsoft plans to nearly double that amount of floor space.

. . . to head

▶ Meanwhile, Microsoft has abandoned plans for future upgrades to either Word for OS/2 or Excel for OS/2, according to a Microsoft official. It will continue product support for the two applications, though.

Smaller than a breadbox

▶ This fall will bring a new class of DOS-based computers called subnotebooks, says Tim Bajarin at Creative Strategies Research International. Eight or nine vendors are preparing this type of machine, but only two or three look likely to finish a product by Comdex/Fall '92.

Overdue

▶ Sources at NCR say the System 3125 notepad will ship before the end of February. NCR had initially expected to ship the product in September 1991, but the notepad ran into production and certification delays.

Not quite in the bank

▶ Mellon Bank has now gone an entire year without a top IS executive, except for two months last fall. Keith Russell, hired from Glendale Federal Bank to replace former IS chief George DiNardo last September, took the job heading Mellon's credit policy department in late October. The search for a new IS chief continues, although Vice Chairman W. Keith Smith says Mellon hopes to announce a hiring this month.

Keep an eye out for the Michelangelo virus between now and March 6. On that date, the painter and sculptor's birthday, the virus will overwrite boot and file allocation table records on the boot disk. News Editor Alan Alper is waiting to see if your tidbit of information is a masterpiece of its own. Reach him by phone at (800) 343-6474, fax at (508) 875-8931 or Compuserve at 76537,2413.

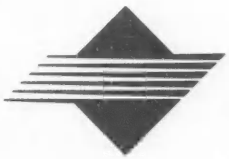
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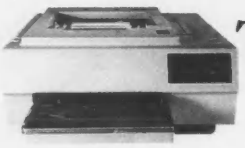
To put Sprint Frame Relay, with a wide range of access options, to work for you, call 1-800-736-1130 right now.



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